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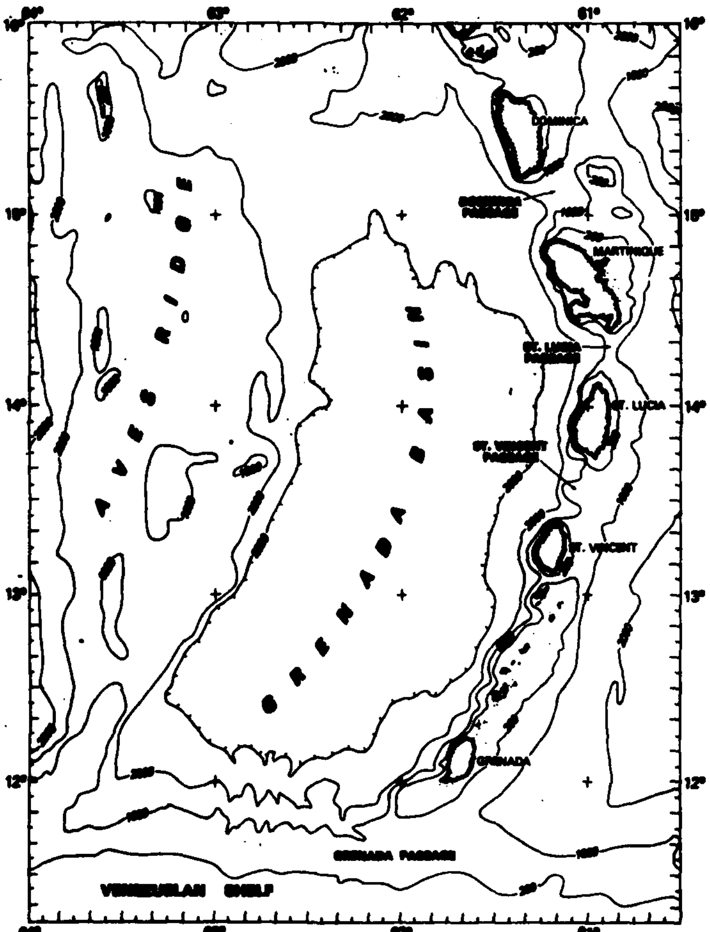
Hydrographic Measurements in the Grenada Basin, Southeastern Caribbean Sea, January 1980



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ABSTRACT

As part of a study on mesoscale variability in the southeastern Caribbean Sea, we occupied 117 conductivity-temperature-depth (CTD) stations and made 235 expendable bathythermograph (XBT) drops during 12-27 January 1980. We present the cruise track of the ship and also the tracks of three aircraft XBT (AXBT) flights made concurrently. We discuss data editing and quality control procedures that were used for CTD (but not for XBT and AXBT) data and present vertical profiles and TS diagrams for each station. In addition to the four water types that have long been known to be present (surface water, subtropical water, Antarctic intermediate water, and North Atlantic deep water) the profiles show many features at vertical scales of order 10 meters.

ACKNOWLEDGMENTS

We wish to thank Adolph Klein of the Naval Oceanographic Office for equipment preparation. Zachariah Hallock and William Teague, also of the Oceanographic Office, created most of the software used for data processing. The officers and men of the USNS BARTLETT, E. Weckstrom commanding, expended much energy and enthusiasm in our behalf. Aside from potable water, there is nothing further we could have asked of them. Paul Mazeika supervised the aircraft flights, and Jim Allender contributed insightfully to cruise planning.

N.V. Lombard works for the Ocean Acoustics Division at NORDA, and S. Raffa works for the Naval Oceanographic Office.

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TABLES

1. INTRODUCTION

As part of a study on mesoscale variability west of the southern Lesser Antilles, we took hydrographic measurements using a Neil Brown conductivity-temperature-depth profiler (CTD) and expendable bathythermographs (XBT's) during January 1980. Here we describe the cruise plan, the data collection, and the data processing. Plots of temperature, salinity, and density (as sigma-t) with pressure and of temperature with salinity are shown for each CTD station.

2. CRUISE PLAN

During 12-27 January 1980, USNS BARTLETT occupied 117 CTD stations and made 235 XBT drops between the southern Lesser Antilles and Aves Ridge (Fig. 1). This coverage was coordinated with airborne XBT (AXBT) flights made on 24, 27, and 29 January. Figure 2 shows the coverage of the ship (CTD/XBT) and the aircraft (AXBT). Table 1 lists all CTD and shipborne XBT positions. Each segment of the cruise and AXBT flight was directed toward some segment of flow that we believed important.

<u>Dominica Section</u> (12-13 January). Numerical modeling had suggested that there might be a cyclonic mean flow in Grenada Basin, perhaps below the sill depth of the straits in the Lesser Antilles (i.e. 1000 m and deeper). Mazeika et al. (1980) reported a cyclonic circulation overlying Tobago Basin east of the Antilles, and we suspected a similar but weaker circulation above Grenada Basin. The Dominica section (Fig. 3) was one of two deep (CTD casts within 50 m of the bottom) east-west sections across Grenada Basin. Throughout the cruise XBT's were used to increase the horizontal resolution of the survey grid.

<u>Square Grid</u> (14-17 January). Satellite-tracked drifting buoys, which measure shallow currents, had been deployed in Grenada Basin by NOAA (Molinari, 1980). Several tracks of these drifters revealed an eddy with about 50 km diameter centered near 14°30'N and 62°30'W. A square grid (Fig. 4) was designed to reveal any similar feature.

<u>St. Vincent Inflow</u> (17-27 January). Stalcup and Metcalf (1972) believed that up to 10×10^6 m^3/sec flow through St. Vincent Passage, and an AXBT flight in January 1979 showed a strong thermal gradient near 13°30'N. The two St. Vincent Inflow grids were designed to measure this flow and any downstream variability. The first grid (17-21 January) extended across Grenada Basin to the foot of Aves Ridge (Fig. 5). The northernmost CTD stations extended within 50 m of the bottom to be consistent with the Dominica Section. The grid was repeated during 22-27 January to examine temporal variability. The second grid also extended westward over the crest of Aves Ridge (Fig. 6).

<u>Straight Line</u> (21 January). Between the end of the first and the beginning of the second St. Vincent Inflow grid, 37 XBT's were dropped (Fig. 7). An XBT was dropped every ten minutes with the ship underway at full speed: XBT spacing was about 3 km. Because our closest spacing on other grids was about 9 km (5 nm) and because 28 km (15 nm) often separated lines within a grid, we wanted to sample on a closer spacing to see if our more coarse sampling was adequate.

<u>AXBT Flight 1</u> (27 January). This flight was planned to survey Grenada Passage and St. Lucia Passage inflows, and to extend the St. Vincent Inflow grid (Fig. 8). Stalcup and Metcalf (1972) believed that transport through Grenada Passage was equal to that through St. Vincent Passage, and that St. Lucia was the third largest source. Brooks (1978) measurements in St. Lucia Passage supported this ranking. Preliminary shipboard results showed large thermal gradients along the northern border of our St. Vincent Inflow grid, so we desired increased coverage north of this grid.

<u>AXBT Flight 2</u> (29 Janaury). This flight was designed to overlap the St. Vincent Inflow grid across St. Lucia Passage (Fig. 9).

<u>AXBT Flight 3</u> (24 January). This flight was designed to emulate Flight 1 (which it preceded), but a navigation failure terminated the flight early.

The positions in Figure 10 are, therefore, in some doubt, but the temperature patterns inferred from the AXBT data are reasonable and resemble comparable data such as from St. Vincent Inflow CTD and XBT stations.

3. DATA COLLECTION AND PROCESSING

We used a Neil Brown CTD with recording on audio magnetic tapes. A rosette sampler was used to gather salinity calibration samples, which were analyzed on an AUTOSAL induction salinometer on board ship. Reversing thermometers were used to verify the collection point (i.e., CTD and thermometer temperatures were compared) for each water sample. Various equipment malfunctions limited the number of salinity samples obtained.

The first CTD sensor used, serial 01-2276-04, became noisy at station 18, and was replaced by serial 01-2127-03 following station 22. Only three calibration samples were obtained with the first sensor. Many early stations, prior to station 23, contained anomalies or gaps in the original recorded data. The manufacturer claims an accuracy (resolution) of 0.005 mmho (0.001 mmho), 0.005°C (0.0005°C), and 6.5 dbar (0.1 dbar) for conductivity, temperature and depth (Brown and Morrison, 1978). Based on our calibration, we claim an accuracy of 0.005 g/kg for salinity and 0.005°C for temperature (Table 2). Salinity was calculated from Bennett (1976) and other variables from Fofonoff (1962).

There may be a bias in salinity below 2500 dbar, however. Five water samples taken at these depths showed that the CTD values were 0.005 g/kg too high. These differences had a range of only 0.002 g/kg and were nearly two standard deviations from the mean difference (Table 2).

Because only three samples were obtained while the first sensor was in use, we compared values of ten casts made just before and just after sensors were changed. We compared pressure, salinity, and density at a potential temperature of 5.000°C. This temperature occurs near 1000 dbar between Antarctic Intermediate water above and North Atlantic deep water below (Wust, 1964). Our assumption was that the TS correlation at this temperature was nearly constant throughout the basin, so that significant biases in the first sensor would be revealed. Table 3 shows that mean salinity and density between the two sets of ten stations differed by about one standard deviation. We conclude that the accuracy of the first sensor was at least 0.01 g/kg and 0.01°C in salinity and temperature.

Data originally recorded on audio tapes were translated to digital form with about a 0.1% data loss. Large spikes were replaced by interpolated values and any gaps in the series were then filled by linear interpolation. Each series (conductivity, temperature, and pressure) was then filtered separately to match sensor time responses. Finally, these series were filtered to average values at one meter intervals; derived parameters (e.g., density) were calculated and results were plotted. The original sampling rate was about 30 Hz and the lowering rate between 30 and 60 m/min, so the original data series had about one sample every 3 cm.

Some problems remained after processing. The lower portion of station 10 was improperly recorded, so that this station extends only to 477 dbar instead of 1500 dbar as planned. Station 23 was entirely lost by a similar recording error. Stations 2, 4, 6, 7, 44, and 74 had gaps caused by loss of signal synchronization. We attribute these gaps to poor cable termination at the sensors and to improper adjustment of the equipment (by us). The failure of the first sensor was manifested by occasional "outliers" or "spikes": discontinuous jumps in temperature and salinity (temperature and salinity were displayed on an x-y plotter during each cast).

The occurrence of these spikes became more frequent until the sensors were changed after station 22. Data from stations 19-21 still have some spikes after processing (nearly 5% of the samples at station 21 were clearly anomalous). Table 5 lists data problems. Figures 11 through 242 show the vertical profiles of temperature, salinity, and density and the TS correlation. Each six digit number refers to station and cast numbers, e.g., 072001 is cast one of station 72 (all our stations had one cast). All plots begin at 14 dbar (sometimes referred to as the "surface"); this peculiar convention increased our processing efficiency and the discarded data were from a usually homogeneous layer between 3 and 14 dbar.

Navigation on BARTLETT was mostly by satellite, and reconstructed positions (using fixes after as well as before stations) are accurate to about 2 km. Relative position accuracy is probably better. Aircraft positions were also accurate to about 2 km, except for AXBT flight 3. The accuracy for this flight was unknown but may be as accurate as 2 km. Temperature patterns constructed from the flight suggest an accuracy of at least 20 km and much better relative accuracy.

4. DISCUSSION

There were four water types (or their remnants) present (nomenclature varies in the literature; e.g., Sverdrup et al., 1942, and Wust, 1964): surface water (the surface mixed layer, about 27°C and 35.7 g/kg), subtropical water (salinity maximum, 20-27°C and greater than 36 g/kg), Antarctic intermediate water (salinity minimum, about 34.8 g/kg), and finally North Atlantic deep water (about 35 g/kg). Station 50, occupied during the first St. Vincent inflow grid (Fig. 5) illustrates these types clearly. The surface layer was 27.02°C and salinity was 35.82 g/kg. The water column was isothermal (within 0.1°C) to 50 dbar and isohaline (within 0.1 g/kg) to 47 dbar. Subtropical water was manifest as a single salinity maximum at 97 dbar (23.60°C, 36.89 g/kg). Antarctic intermediate water caused a broad salinity minimum between 600 and 730 dbar, with two local minima at 624 dbar (6.38°C and 34.72 g/kg) and at 710 dbar (5.85°C and 34.71 g/kg). Salinity then increased towards the bottom, reaching 34.977 g/kg (4.181°C in situ; 3.914°C potential) at 2862 dbar; these values represent North Atlantic deep water. The deepest 1000 dbar was nearly homogeneous: values at 1862 dbar were 34.969 g/kg and 4.125°C (3.965°C potential temperature). While this station illustrates clearly the hydrographic features that have been known for more than forty years (Sverdrup et al. 1942), smaller scale features also exist that were not evident in earlier Nansen bottle data.

Surface isothermal and isohaline layers usually were not coincident. Station 1, where the isothermal layer was 10 dbar deeper than the isohaline layer, is a good illustration. Temperature, which was 27.23°C at the surface, remained constant (within 0.1°C) to 67 dbar. Salinity, which was 35.72 g/kg (density, expressed as sigma-t: 23.21 kg/m^3) at the surface was constant (within 0.1 g/kg) to 55 dbar (27.24°C, 35.79 g/kg, 23.26 kg/m^3), but then increased to 36.64 g/kg (27.13°C, 23.93 kg/m^3) at 67 dbar. Nearly all stations had a deeper isothermal layer than isohaline layer, so these data forcefully illustrate the inadequacy of defining the surface mixed layer with temperature data alone.

Many stations also had a local temperature maximum, always density-compensated by increasing salinity, at the base of the isothermal layer. Station 11 had such a temperature maximum of about 10 dbar thickness. Temperature was 27.02°C at the surface, isothermal to 39 dbar, and decreased to 26.91°C at 49 dbar. It then increased to 27.36°C, the maximum temperature in the profile, at 57 dbar and thereafter decreased with pressure.

Finestructure, "stepiness" in the temperature and salinity profiles on scales of a few meters, was evident at most stations. It was most strongly expressed near the high salinity core of the subtropical water and at stations near strong bathymetric gradients, such as occur near the islands and near seamounts on Aves Ridge. Stations 26-28, taken east of St. Vincent Passage, and station 112, taken above Aves Ridge, illustrate finestructure both as steps in monotonic temperature and salinity profiles and as intrusions of water causing temperature and salinity inversions. All but one of the intrusions was density-compensated so that static stability was maintained. At station 26, however, an apparent density inversion was recorded between 81 and 92 dbar. Temperature was nearly constant within this layer, decreasing from 27.06°C at 81 dbar to 27.02°C at 87 dbar and then increasing to 27.07°C at 91 dbar. Salinity decreased strongly over this same interval from 36.65 g/kg at 81 dbar (density: 23.96 kg/m^3) to a minimum of 36.54 g/kg (23.90 kg/m^3) at 87 dbar, and then it increased to 36.66 g/kg (23.97 kg/m^3) at 92 dbar.

Several stations that were not generally rich in finestructure had well-developed multiple salinity maxima in the subtropical water. For example, station 18 had three distinct maxima. The shallowest extended from 72 to 83 dbar with a maximum salinity of 36.73 g/kg, the next layer extended from 84 to 117 dbar with a maxima of 36.85 g/kg and the deepest layer extended from 118 to 158 decibars with a maxima of 36.87 g/kg. Data such as these cast doubt on the efficacy of tracing the salinity maximum using data from widely-spaced sample bottles (e.g., Wust, 1964).

If the smooth TS curve for station 50 (used above to illustrate the water types present) is taken as a standard, then many stations display large deviations from this curve in the subtropical water, either toward lower or higher salinity. Station 18, for example, showed two low-salinity deviations, which produced the three salinity maxima which were discussed in the preceding paragraph. Stations 51 and 54 on the other hand, each had a single high salinity deviation. While the maximum salinity at station 50 was 36.89 g/kg (110 dbar, 23.60°C), at station 51 it was 37.12 g/kg (124 dbar, 24.49°C) and at station 54 it was also 37.12 g/kg (121 dbar, 24.39°C). These deviations from the gross TS curve illustrate the multiple origins of the subtropical water and suggest strong variations within this stratum of such derived parameters as sound speed.

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APPENDIX

Digital data are stored in a format called FEB files (Fast and Easy Binary files; Hallock, 1980). These files were designed for repeated access using mass storage (e.g., magnetic disc), and are the format in which data are archived. Each file is a series of variable length records grouped into segments; stations may consist of one or of several segments. Within each segment, data consist of a series of cycles, each cycle being a value of conductivity, pressure, temperature, and time. Table 5 shows the sequence in which the CTD data are archived.

TABLE I

STATIONS

(1) CTD/XBT		TIME		LATITUDE (N)	LONGITUDE (W)	(2) DEPTH (M)	(3) [illegible]
DOMINICA SECTION							
C1		1723	12 Jan 80	15-22.4	63-32.5	[illegible]	Bottom
	X1	1908		15-22.9	63-30.4	1597	
	X2	1949		15-23.4	63-24.5	1825	
C2		2033		15-23.8	63-19.4	2066	Bottom
	X3	2230		15-23.5	63-14.5	2217	
C3		0030	13 Jan 80	15-24.0	63-05.8	[illegible]	Bottom
	X4	0229		15-23.2	62-57.8	2403	
	X5	0259		15-23.0	62-53.4	[illegible]	
C4		0342		15-22.5	62-51.8	[illegible]	Bottom
	X6	0648		15-22.0	62-44.8	2215	
	X7	0737		15-22.1	62-38.6	2217	
C5		0822		15-22.1	62-35.8	2059	Bottom
	X8	1102		15-21.7	62-31.0	[illegible]	
	X9	1154		15-21.7	62-24.7	2156	
C6		1252		15-21.7	62-18.4	2250	Bottom
	X10	1544		15-21.9	62-14.1	2360	
	X11	1630		15-22.0	62-09.0	2520	
	X12	1712		15-22.2	62-04.5	2514	
	X13	1751		15-22.3	62-00.5	2381	
	X14	1930		15-23.6	61-47.2	2049	
	X15	2014		15-24.1	61-40.6	2360	
C7		2030		15-24.1	61-39.7	2323	Bottom
	X16	2237		15-24.2	61-35.0	1940	
C8		2324		15-22.5	61-29.6	1352	Bottom
SQUARE GRID							
C9		0356	14 Jan 80	15-11.0	61-58.0	[illegible]	1500M
	X17	0608		15-10.6	62-08.3	[illegible]	
C10		0726		15-10.8	62-18.1	2035	1500M
	X18	0945		15-10.6	62-30.1	2405	
C11		1109		15-10.2	62-38.8	2560	1500M
	X19	1304		15-09.8	62-50.8	2232	
C12		1415		15-10.8	63-00.4	1862	1500M
	X20	1649		14-58.8	63-00.2	1515	
	X21	1803		15-00.0	62-50.7	1917	
	X22	1940		15-00.3	62-39.3	2265	
	X23	2233		14-59.7	62-18.9	2626	
	X24	0010	15 Jan 80	15-00.5	62-07.7	2725	
	X25	0133		15-00.7	61-58.0	2641	
C13		0254		14-51.8	61-57.3	2717	1500M
	X26	0449		14-50.7	62-08.6	2761	
C14		0547		14-49.5	62-19.0	2715	1500M
	X27	0750		14-50.2	62-29.8	2432	

CTD/XBT (1)		TIME	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
C15		0855 15 Jan 80	14-51.0	62-40.9	2257	1500M
	X28	1035	14-50.7	62-49.3	1847	
C16		1143	14-50.2	63-00.3	1481	1500M
	X29	1349	14-40.4	62-59.3	1536	
	X30	1458	14-29.8	62-48.5	1344	
	X31	1610	14-29.8	62-40.1	2988	
	X32	2022	14-41.3	62-08.3	2816	
	X33	2140	14-40.2	61-58.6	2776	
C17		2251	14-29.6	62-00.0	2827	1500M
C18		0147 16 Jan 80	14-30.2	62-19.8	2838	1500M
	X34	0356	14-31.3	62-32.0	2670	
C19		0455	14-31.3	62-41.3	1490	1500M
	X35	0637	14-32.0	62-53.8	1628	
C20		0729	14-30.6	63-00.3	1474	1500M
	X36	0929	14-20.0	63-01.9	1456	
	X37	1050	14-18.8	62-49.7	1737	
	X38	1202	14-19.3	62-38.3	1560	
	X39	1207	14-19.4	62-37.5	1560	
	X40	1211	14-19.5	62-36.8	1560	
C21		1303	14-19.5	62-36.7	1561	1500M
	X41	1453	14-18.8	62-29.5	2507	
	X42	1600	14-19.9	62-19.8	2860	
	X43	1712	14-21.0	62-09.7	2900	
	X44	1809	14-21.0	62-01.5	2845	
C22		1909	14-12.7	62-02.6	2867	1500M
	X45	2121	14-12.7	62-13.4	2878	
C23		2214	14-10.1	62-18.4	2878	1500M
	X46	0016 17 Jan 80	14-10.4	62-29.7	2754	
C24		0120	14-09.2	62-37.0	1679	1500M
	X47	0318	14-10.6	62-47.3	1917	
C25		0439	14-11.2	62-53.2	1580	1500M
	X48	0709	13-58.8	62-57.9	1466	
	X49	0801	14-00.0	62-45.2	1905	
	X50	0903	14-00.6	62-38.2	1951	
	X51	1000	14-00.0	62-29.0	2399	
	X52	1103	13-59.3	62-18.3	2896	
	X53	1107	13-59.3	62-17.6	2896	
	X54	1204	13-59.3	62-08.5	2889	
	X55	1306	14-01.3	61-58.8	2889	
	X56	1443	13-54.6	61-44.2	2926	
	X57	1443	13-54.6	61-44.2	2926	

St. Vincent Inflow I

C26		2037	13-38.8	60-56.4	220	Bottom
	X58	2130	13-33.3	60-56.3	201	
	X59	2134	13-32.6	60-56.5	281	
C27		2213	13-27.8	61-00.0	640	Bottom
	X60	2324	13-21.5	61-01.4	476	

CTD/XBT (1)		TIME		LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
C28		0030	18 Jan 80	13-15.8	61-04.0	409	Bottom
	X61	0355		13-12.5	61-26.0	2450	
C29		0453		13-16.1	61-19.7	1200	Bottom
	X62	0612		13-22.6	61-18.0	1847	
	X63	0646		13-28.2	61-17.5	[illegible]	
C30		0730		13-33.7	61-17.8	2569	1500M
	X64	0857		13-39.4	61-17.4	2677	
	X65	0933		13-45.2	61-17.0	2761	
C31		1009		13-49.8	61-16.6	2743	Bottom
	X66	1218		13-49.2	61-14.5	2569	
	X67	1238		13-49.8	61-11.2	2285	
C32		1257		13-50.6	61-07.2	1766	Bottom
C33		1651		13-53.2	61-37.5	2860	Bottom
	X68	1952		13-43.0	61-34.8	2838	
	X69	2001		13-41.3	61-35.0	2825	
C34		2040		13-35.6	61-35.1	2816	1500M
	X70	2207		13-31.5	61-34.2	2805	
	X71	2230		13-27.6	61-33.5	2780	
C35		2309		13-21.1	61-32.3	2769	1500M
	X72	0015	19 Jan 80	13-18.1	61-31.9	2750	
	X73	0044		13-13.7	61-32.7	2772	
C36		0121		13-08.5	61-33.7	2772	1500M
C37		0342		13-02.9	61-45.8	2891	1500M
	X74	0513		13-09.7	61-48.7	2898	
	X75	0551		13-16.1	61-48.4	2824	
C38		0624		13-20.5	61-48.4	2889	1500M
	X76	0809		13-27.3	61-48.8	2889	
	X77	0844		13-32.7	61-49.0	2889	
C39		0919		13-38.5	61-49.3	2889	1500M
	X78	1047		13-43.9	61-48.5	2889	
	X79	1122		13-49.4	61-47.8	2889	
C40		1200		13-55.0	61-47.9	2889	Bottom
C41		1528		13-57.5	61-53.0	2889	Bottom
	X80	1817		13-50.5	62-02.3	2900	
	X81	1831		13-47.7	62-02.8	2900	
C42		1900		13-32.2	62-03.7	2900	1500M
	X82	2021		13-38.8	62-02.3	2900	
	X83	2045		13-33.5	62-03.1	2904	
C43		2130		13-29.4	62-03.3	2904	1500M
	X84	2225		13-26.8	62-03.4	2908	
	X85	2302		13-21.7	62-03.6	2908	
C44		2336		13-17.1	62-04.0	2908	1500M
	X86	0058	20 Jan 80	13-12.0	62-04.4	2908	
	X87	0117		13-09.2	62-03.7	2908	
C45		0150		13-04.5	62-02.6	2908	1500M
C46		0422		13-00.2	62-14.2	2908	1500M
	X88	0552		13-02.9	62-14.2	2908	
	X89	0712		13-08.1	62-14.7	2908	
C47		0726		13-13.1	62-18.0	2908	1500M
	X90	0902		13-20.0	62-18.0	2915	

CTD/XBT (1)	TIME	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
X91	0933 20 Jan 80	13-25.2	62-18.0	2908	
C48	1044	13-29.6	62-18.2	2911	1500M
X92	1135	13-25.0	62-18.2	2908	
X93	1205	13-38.0	62-18.2	2907	
C49	1248	13-45.0	62-18.2	2911	1500M
X94	1420	13-50.9	62-17.1	2907	
X95	1453	13-55.0	62-17.3	2907	
C50	1534	14-00.9	62-17.9	2911	Bottom
C51	2021	13-59.7	62-48.8	1900	Bottom
X96	2246	13-59.3	62-30.2	1902	
X97	2316	13-59.5	62-35.7	2487	
C52	2347	13-59.8	62-31.7	2600	Bottom
X98	0200 21 Jan 80	13-55.0	62-31.5	2743	
X99	0240	13-48.3	62-31.4	2754	
C53	0305	13-44.5	62-31.4	2644	1500M
X100	0428	13-37.9	62-30.8	2900	
X101	0447	13-33.7	62-31.8	2900	
C54	0507	13-28.6	62-32.8	2904	1500M
X102	0645	13-23.9	62-32.7	2908	
X103	0713	13-18.5	62-33.2	2895	
C55	0752	13-13.8	62-32.8	2909	1500M
X104	0906	13-09.6	62-32.7	2895	
X105	0937	13-04.0	62-32.5	2895	
C56	1021	12-56.3	62-32.7	2911	1500M
X106	1205	12-59.7	62-38.6	2906	
X107	1228	12-59.9	62-41.7	2906	
C57	1303	12-59.6	62-47.8	2911	1500M
X108	1429	12-59.6	62-53.3	2890	
X109	1458	12-59.6	62-58.2	2402	
C58		12-59.9	63-01.3	1490	1500M

Straight Line

X110	1634	12-59.0	62-59.3	1518
X111	1640	12-59.3	62-58.5	1582
X112	1650	12-59.8	62-57.1	1793
X113	1700	13-00.4	62-55.6	2233
X114	1710	13-00.9	62-54.1	2083
X115	1720	13-01.4	62-52.7	2525
X116	1730	13-01.0	62-51.2	2880
X117	1740	13-01.5	62-49.8	2988
X118	1750	13-03.1	62-48.3	2906
X119	1800	13-03.6	62-46.8	2906
X120	1810	13-04.2	62-45.4	2906
X121	1820	13-04.7	62-42.9	2906
X122	1830	13-05.3	62-41.5	1906
X123	1840	13-05.8	62-41.0	2906
X124	1850	13-06.4	62-39.5	2906
X125	1900	13-06.9	62-38.1	2906
X126	1910	13-07.5	62-36.6	2906
X127	1924	13-08.2	62-34.5	2906
X128	1930	13-08.4	62-33.6	2906

CTD/XBT (1)	TIME	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
X129	1940 21 Jan 80	13-08.7	62-32.1	2906	
X130	1950	13-09.0	62-30.5	2906	
X131	2000	13-09.3	62-29.0	2906	
X132	2010	13-09.6	62-27.4	2910	
X133	2020	13-09.9	62-25.9	2910	
X134	2030	13-10.2	62-24.3	2910	
X135	2040	13-10.5	62-22.8	2910	
X136	2050	13-10.7	62-20.8	2910	
X137	2100	13-10.8	62-19.9	2910	
X138	2110	13-11.3	62-18.0	2910	
X139	2120	13-11.7	62-16.5	2910	
X140	2130	13-12.2	62-15.1	2910	
X141	2140	13-12.6	62-13.6	2910	
X142	2150	13-13.1	62-12.2	2910	
X143	2200	13-13.5	62-10.7	2910	
X144	2210	13-14.0	62-09.3	2910	
X145	2220	13-14.4	62-07.8	2910	
X146	2230	13-14.9	62-06.4	2910	

ST. VINCENT INFLOW II

CTD/XBT (1)	TIME	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
C59	0548 22 Jan 80	13-42.7	61-03.1	824	Bottom
C60	0715	13-26.7	61-05.0	417	Bottom
C61	0280	13-20.7	61-07.3	787	Bottom
C62	0926	13-25.3	61-09.2	1329	Bottom
C63	1130	13-19.3	61-17.9	1289	1200M
X147	1247	13-25.0	61-17.8	2160	
X148	1307	13-28.3	61-17.7	2278	
C64	1339	13-22.5	61-18.2	2542	1200
X149	1453	13-37.2	61-18.2	2640	
X150	1522	13-41.8	61-18.2	2757	
C65	1632	13-47.0	61-18.2	2749	1200
X151	1731	13-51.8	61-17.2	2765	
X152	1800	13-56.5	61-17.9	2706	
C66	1830	14-00.4	61-17.5	1692	1200
X153	1942	13-59.8	61-11.3	2465	
X154	2004	14-00.0	61-08.3	1221	
C67	2034	14-00.0	61-05.0	1046	1200
C68	0003 23 Jan 80	14-00.4	61-33.6	2853	1200
X155	0115	13-56.5	61-33.9	2834	
X156	0130	13-54.2	61-33.7	2816	
X157	0204	13-49.0	61-33.0	2838	
C69	0230	13-45.9	61-33.4	2836	1200
X158	0410	13-38.7	61-34.0	2825	
X159	0432	13-25.1	61-34.0	2849	
C70	0508	13-29.6	61-34.5	2807	1200
X160	0630	13-24.9	61-33.7	2801	
X161	0700	13-20.0	61-33.0	2787	
C71	0733	13-15.7	61-32.5	2743	
X162	0855	13-09.8	61-32.5	2761	
X163	0925	13-05.4	61-31.8	2663	

CTD/XBT		TIME (1)	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
C72		1066 23 Jan 80	12-59.7	61-32.8	1761	1200
C73		1219	13-00.1	61-47.9	2880	1200
	X164	1338	13-05.0	61-48.0	2889	
	X165	1409	13-10.0	61-47.7	2897	
C74		1447	13-15.2	61-47.7	2890	1200
	X166	1603	13-20.0	61-47.8	2889	
	X167	1633	13-15.0	61-47.8	2889	
C75		1728	13-29.9	61-47.6	2889	1200
	X168	1847	13-26.4	61-49.0	2891	
	X169	1908	13-39.8	61-48.8	2889	
C76		1942	13-44.1	61-48.4	2889	1200
	X170	2055	13-48.3	61-48.3	2889	
	X171	2137	13-55.3	61-48.5	2889	
C77		2219	14-01.3	61-48.6	2889	1200
C78		0000 24 Jan 80	14-00.1	61-58.0	2889	1500
	X172	0200	13-53.6	62-02.2	2897	
	X173	0234	13-48.6	62-02.5	2900	
C79		0313	13-43.3	62-02.5	2900	1200
	X174	0440	13-40.0	62-02.5	2910	
	X175	0459	13-33.6	62-02.8	2910	
C80		0522	13-31.0	62-03.5	2911	1200
	X176	0640	13-24.5	62-03.0	2908	
	X177	0719	13-18.0	62-03.3	2907	
C81		0730	13-16.7	62-03.3	2912	1200
	X178	0853	13-10.0	62-03.3	2906	
	X179	0921	13-05.0	62-03.2	2907	
C82		0955	12-59.6	62-03.2	2913	1200
C83		1210	12-58.4	62-17.3	2909	1200
	X180	1333	13-02.8	62-18.0	2910	
	X181	1358	13-06.0	62-18.0	2910	
C84		1443	13-12.1	62-18.3	2910	1200
	X182	1603	13-15.9	62-18.3	2908	
	X183	1632	13-20.0	62-17.7	2908	
	X184	1706	13-25.0	62-17.3	2908	
C85		1753	13-31.3	62-18.1	2908	1200
	X185	1907	13-25.0	62-18.0	2904	
	X186	1942	13-40.5	62-18.2	2904	
C86		2017	13-47.0	62-18.7	2904	1200
	X187	2126	13-50.3	62-18.6	2900	
	X188	2156	13-55.5	62-18.7	2891	
C87		2230	14-00.4	62-18 5	2897	1200
C88		0036 25 Jan 80	13-59.9	62-31.8	2615	1200
	X189	0212	13-52.9	62-31.5	2754	
	X190	0246	13-48.8	62-31.6	2807	
C89		0326	13-43.2	62-31.8	2593	1200
	X191	0441	13-39.5	62-31.5	2904	
	X192	0514	13-32.9	62-30.8	2906	
C90		0614	13-22.0	62-30.3	2910	1200
	X193	0723	13-18.3	62-32.0	2899	
C91		0753	13-14.0	62-24.6	2909	1200
	X194	0901	13-10.0	62-34.5	2911	
	X195	0924	13-05.8	62-34.2	2911	

(1) CTD/XBT		TIME	LATITUDE (N)	LONGITUDE (W)	(2) DEPTH (M)	COMMENT
C92		1000 25 Jan 80	13-00.4	62-32.8	2910	1200
C93		1217	13-00.2	62-47.6	2908	1200
	X196	1355	13-05.0	62-48.2	2902	
	X197	1417	13-10.5	62-47.9	2377	
C94		1502	13-15.2	62-48.0	1965	1200
	X198	1654	13-20.0	62-48.2	[illegible]	
	X199	1729	13-25.0	62-49.1	1878	
C95		1804	13-29.8	62-47.8	1783	1200
	X200	1925	13-25.0	62-48.4	1829	
	X201	1957	13-40.0	62-48.4	1994	
C96		2037	13-45.2	62-48.6	1975	1200
	X202	2158	13-50.0	62-48.0	2001	
	X203	2232	13-55.5	62-47.6	200[illegible]	
C97		2302	13-58.7	62-47.9	1895	1200
C98		0126 26 Jan 80	13-57.4	63-03.8	1177	1200
	X204	0248	13-49.3	63-04.0	1141	
	X205	0325	13-44.2	63-04.0	1108	
C99		0400	13-39.8	63-04.3	1072	1200
	X206	0513	13-24.4	63-02.9	1079	
C100		0543	13-29.8	63-03.2	1140	1200
	X207	0652	13-24.7	63-02.9	115[illegible]	
	X208	0719	13-20.0	63-02.9	1170	
C101		0753	13-14.8	63-03.1	1175	1200
	X209	0905	13-10.0	63-03.6	1[illegible]34	
	X210	0924	13-04.8	63-03.5	1361	
C102		1020	12-59.7	63-03.5	1478	1200
C103		1229	12-59.6	63-17.9	1110	[illegible]
	X211	1351	13-05.0	63-18.1	1057	
	X212	1425	13-10.0	63-18.0	103[illegible]	
C104		1500	13-15.6	63-18.4	1006	1200
	X213	1613	13-21.2	63-18.0	1101	
	X214	1639	13-25.2	63-17.5	91[illegible]	
C105		1715	13-20.0	63-16.9	79[illegible]	[illegible]
	X215	1830	13-35.6	63-16.[illegible]	50[illegible]	
	X216	1900	13-40.0	63-16.5	58[illegible]	
C106		1936	13-44.4	63-18.0	91[illegible]	1200
	X217	2051	13-51.8	63-18.6	[illegible]	
	X218	2126	13-56.7	63-18.8	[illegible]	
C107		2200	14-00.3	63-19.1	[illegible]	1200
C108		0006 27 Jan 80	14-00.4	63-32.5	306	1200
	X219	0139	13-54.2	63-33.6	1547	
	X220	0205	12-50.0	63-34.0	1328	
C109		0157	13-46.0	63-34.0	1269	1200
	X221	0402	13-40.2	63-34.0	1145	
	X222	0433	13-25.1	63-34.2	1134	
C110		0513	13-30.2	63-33.6	1145	1200
	X223	0632	13-25.0	63-32.8	1180	
	X224	0704	13-19.3	63-33.5	1211	
C111		0739	13-14.8	63-33.8	116[illegible]	1200
	X225	0856	13-09.9	63-34.0	1015	
	X226	0927	13-05.0	63-34.0	457	

CTD/XBT (1)	TIME	LATITUDE (N)	LONGITUDE (W)	DEPTH (M) (2)	COMMENT
C112	1000 27 Jan 80	13-00.3	63-33.7	567	1200
C113	1144	13-00.6	63-48.0	2222	1200
X227	1308	13-05.0	63-48.0	2317	
X228	1337	13-10.0	63-48.0	1920	
C114	1430	13-14.1	63-48.0	1984	1200
X229	1537	13-21.6	63-47.0	1744	
X230	1603	13-26.0	63-47.1	1492	
C115	1630	13-30.3	63-47.5	1529	1200
X231	1737	13-34.9	63-48.0	1744	
X232	1807	13-40.0	63-47.9	1558	
X233	1812	13-40.9	63-47.9	1598	
C116	1837	13-44.7	63-47.9	1856	1200
X234	1948	13-49.9	63-48.1	1679	
X235	2016	13-54.7	63-48.5	2012	
C117	2050	14-00.2	63-47.6	2347	1500

(1) CTD Stations have a C prefix, XBT drops an X prefix.

(2) Water depth at location of CTD cast or XBT drop

(3) Planned depth. XBT's last until approximately 700M depth. CTD casts were to the depth indicated or close to the bottom; close varied from 5 to 50M depending on the water depth, bottom steepness, and weather.

TABLE 2 SALINITY CALIBRATION

Sensor 01-2276-04

STATION	PRESSURE (dbar)	CTD (g/kg)	AUTOSAL (g/kg)	DIFFERENCE (g/kg)
1	928	34.837 ± 0.001	34.836 ± 0.005	+0.001
2	2034	34.976 ± 0.0005	34.975 ± 0.002	+0.001
22	1528	34.974 ± 0.002	34.960	+0.014
		Sensor 01-2127-03		
25	1518	34.964	34.968	-0.004
33	2831	34.976	34.971	+0.005
34	1531	34.962	34.958	+0.004
35	1516	34.961	34.960	+0.001
36	1508	34.961	34.964	-0.003
37	1517	34.960	34.960	0.000
38	1526	34.960	34.962	-0.002
40	2847	34.976	34.970	+0.006
41	2856	34.976	34.971	+0.005
42	1540	34.963	34.963	0.000
43	1508	34.957	34.956	+0.001
44	1514	34.959	34.958	+0.001
46	1507	34.962	34.964	-0.002
47	1506	34.964	34.964	0.000
48	1512	34.962	34.963	-0.001
50	2863	34.976	34.972	+0.004
51	1883	34.971	34.969	+0.002

TABLE 2 SALINITY CALIBRATION

Sensor 01-2127-03

STATION	PRESSURE (dbar)	CTD (g/kg)	AUTOSAL (g/kg)	DIFFERENCE (g/kg)
52	2571	34.975	34.970	+0.005
53	1527	34.964	34.963	+0.001
54	1512	34.964	34.964	0.000
"	10	35.778	35.779	-0.001
55	1508	34.964	34.965	-0.001
"	9	35.793	35.792	+0.001
56	1506	34.962	34.961	+0.001
"	9	35.740	35.738	+0.002
57	1512	34.964	34.963	+0.001
"	8	35.762	35.761	+0.001
58	1500	34.962	34.961	+0.001
"	9	35.655	35.654	+0.001
63	1209	34.943	34.948	-0.005
64	1217	34.942	34.941	+0.001
65	1211	34.946	34.947	-0.001
66	1248	34.948	34.948	0.000
67	1026	34.899	34.900	-0.001
68	1214	34.950	34.954	-0.004
69	1213	34.947	34.948	-0.001
70	1207	34.945	34.946	-0.001
71	1206	34.945	34.966	-0.021
72	1213	34.941	34.939	+0.002

TABLE 2 SALINITY CALIBRATION

Sensor 01-2127-03

STATION	PRESSURE (dbar)	CTD (g/kg)	AUTOSAL (g/kg)	DIFFERENCE (g/kg)
74	1211	34.948	34.947	+0.001
75	1213	34.942	34.939	+0.003
76	1219	34.945	34.943	+0.002
77	1207	34.944	34.941	+0.003
79	1211	34.945	34.942	+0.003
80	1208	34.942	34.942	0.000
81	1205	34.942	34.943	-0.001
82	1207	34.944	34.945	-0.001
83	1207	34.950	34.950	0.000
84	1209	34.944	34.945	-0.001
85	1210	34.945	34.949	-0.004
86	1212	34.951	34.951	0.000
87	1210	34.950	34.951	-0.001
88	1210	34.950	34.950	0.000
89	1209	34.949	34.947	+0.002
90	801	34.787	34.788	-0.001
91	803	34.784	34.789	-0.005
92	504	34.971	34.964	+0.007
93	602	34.805	34.806	-0.001
94	1211	34.946	34.945	+0.001
95	1208	34.942	34.941	+0.001
96	1204	34.956	34.955	+0.001

TABLE 2 SALINITY CALIBRATION

Sensor 01-2127-03

STATION	PRESSURE (dbar)	CTD (g/kg)	AUTOSAL (g/kg)	DIFFERENCE (g/kg)
98	1153	34.938	34.937	+0.001
99	1040	34.915	34.916	-0.001
100	129	36.881	36.889	-0.008
101	1151	34.945	34.944	+0.001
102	1208	34.949	34.950	-0.001
103	1069	34.902	34.903	-0.001
104	960	34.871	34.872	-0.001
105	761	34.760	34.745	+0.015
106	887	34.868	34.867	+0.001
107	1208	34.950	34.947	+0.003
109	1214	34.947	34.946	+0.001
110	1108	34.926	34.924	+0.002
111	1119	34.922	34.921	+0.001

SUMMARY	SAMPLES	MEAN DIFFERENCE	STANDARD DEVIATION
Sensor 01-2276-04	3	+0.005	0.008
Sensor 01-2127-03*	72	+0.0004	0.003

*Stations 71 and 105 are excluded, although reversing thermometer and CTD temperatures agreed within 0.02°C.

AUTOSAL Serial Number 42070.

TABLE 3 SENSOR COMPARISON

Potential Temperature = 5.000°C

Sensor 01-2276-04

STATION	PRESSURE (dbar)	SALINITY (g/kg)	DENSITY (kg/m³)*
13	1006	34.875	27.587
14	1004	34.881	27.592
15	970	34.888	27.598
16	925	34.888	27.599
17	1034	34.882	27.592
18	965	34.884	27.595
19	992	34.887	27.597
20	962	34.886	27.596
21	956	34.889	27.599
22	992	34.896	27.604
	981 ± 31	34.886 ± 0.006	27.596 ± 0.005

Sensor 01-2127-03

STATION	PRESSURE (dbar)	SALINITY (g/kg)	DENSITY (kg/m³)*
24	928	34.878	27.590
25	959	34.884	27.594
29	953	34.876	27.588
30	948	34.883	27.594
31	964	34.885	27.596
32	953	34.870	27.583
33	1015	34.883	27.593
34	1013	34.882	27.593

TABLE 3 SENSOR COMPARISON

Potential Temperature = 5.000C°

Sensor C1-2127-33

STATION	PRESSURE (dbar)	SALINITY (g/kg)	DENSITY (kg/m^3)*
35	971	34.882	27.593
36	1008	34.882	27.593
	981 ± 30	34.880 ± 0.005	27.592 ± 0.004

*in situ

TABLE 4

DATA PROBLEMS

Station Number	Problem
2	Gaps: 18-29, 1559-1561, 1712-1717, 1972-1974 dbar. (1)
4	Gaps: 2149-2165 dbar. (1)
6	Gaps: 748-807, 1223-1235 dbar. (1)
10	Data below 477 dbar are missing.
19, 20, 21	Data are noisy, especially in salinity and density.
23	All data are missing.
44	Gap: 592-600 dbar. (1)
74	Gap: 809-819 dbar. (1)
99	Salinity spike: 485 dbar.

NOTE: (1): All gaps were filled by linear interpolation.

TABLE 5 STATION FEB FILE INDEX (1 m)

	0	1	2	3	4	5	6	7	8	9
00		4850 1 1-1	1900 1 3-1	4973 1 3-4	1900 1 3-4	4973 1 3-10	1900 1 3-7	1900 1 3-10	4850 1 2-2	4850 1 2-4
01	4983 3 1-1	4850 1 2-6	4850 1 2-8	4850 1 2-10	4850 1 2-12	4850 2 2-1	4850 2 2-3	4850 2 2-5	4850 2 2-7	1914 1 2-1
02	1914 1 2-3	1914 1 2-5	4850 3 2-1	NO DATA	4850 3 2-3	4850 3 2-5	4983 3 1-2	4983 3 1-3	4983 3 1-4	4850 3 2-7
03	4850 3 2-9	4973 1 3-19	4973 2 2-1	4973 2 3-3	4850 3 2-11	4850 3 2-13	4850 4 2-1	4850 4 2-3	4850 4 2-5	4850 4 2-7
04	4973 2 3-6	4973 2 3-9	4850 4 2-9	4850 4 2-11	1900 2 2-3	4850 5 2-1	4850 5 2-3	4850 5 2-5	4850 5 2-7	4850 5 2-9
05	4973 2 3-12	4973 2 2-15	4973 2 3-17	4850 5 2-11	4850 5 2-13	4850 6 2-1	4850 6 2-3	4850 6 2-5	4850 6 2-7	4983 3 1-5
06	4983 3 1-6	4983 3 1-7	4850 6 2-9	4850 6 2-11	4850 6 2-13	4850 7 2-1	4850 7 2-3	4850 7 2-5	4850 7 2-7	4850 7 2-9
07	4850 7 2-11	4850 7 2-13	4850 8 2-1	4850 8 2-3	1900 2 2-1	4850 8 2-7	4850 8 2-9	4850 8 2-11	4850 8 2-13	4850 9 2-1
08	4850 9 2-3	4850 9 2-5	4850 9 2-7	4850 9 2-9	4850 9 2-11	4850 9 2-13	4850 10 2-1	4850 10 2-3	4850 10 2-5	4850 10 2-7
09	4850 11 2-1	4850 11 2-3	4850 11 2-5	4850 11 2-7	4850 11 2-9	4850 11 2-11	4850 11 2-13	4850 12 2-1	4850 12 2-3	4850 12 2-5
10	4850 12 2-7	4850 12 2-9	4850 12 2-11	4850 12 2-13	4850 13 1-1	4850 13 1-2	4850 13 1-3	4850 13 2-4	4850 13 2-6	4850 13 2-8
11	4850 13 2-10	4850 14 2-1	4850 14 1-3	4850 14 2-4	4850 14 2-6	4850 14 2-8	4850 14 2-10	4850 14 2-12		

EXPLANATION: Station 064 (heavy box)
Data on Tape 4850, file 6
Data consists of 2 segments starting with segment number 13 (1 meter values)

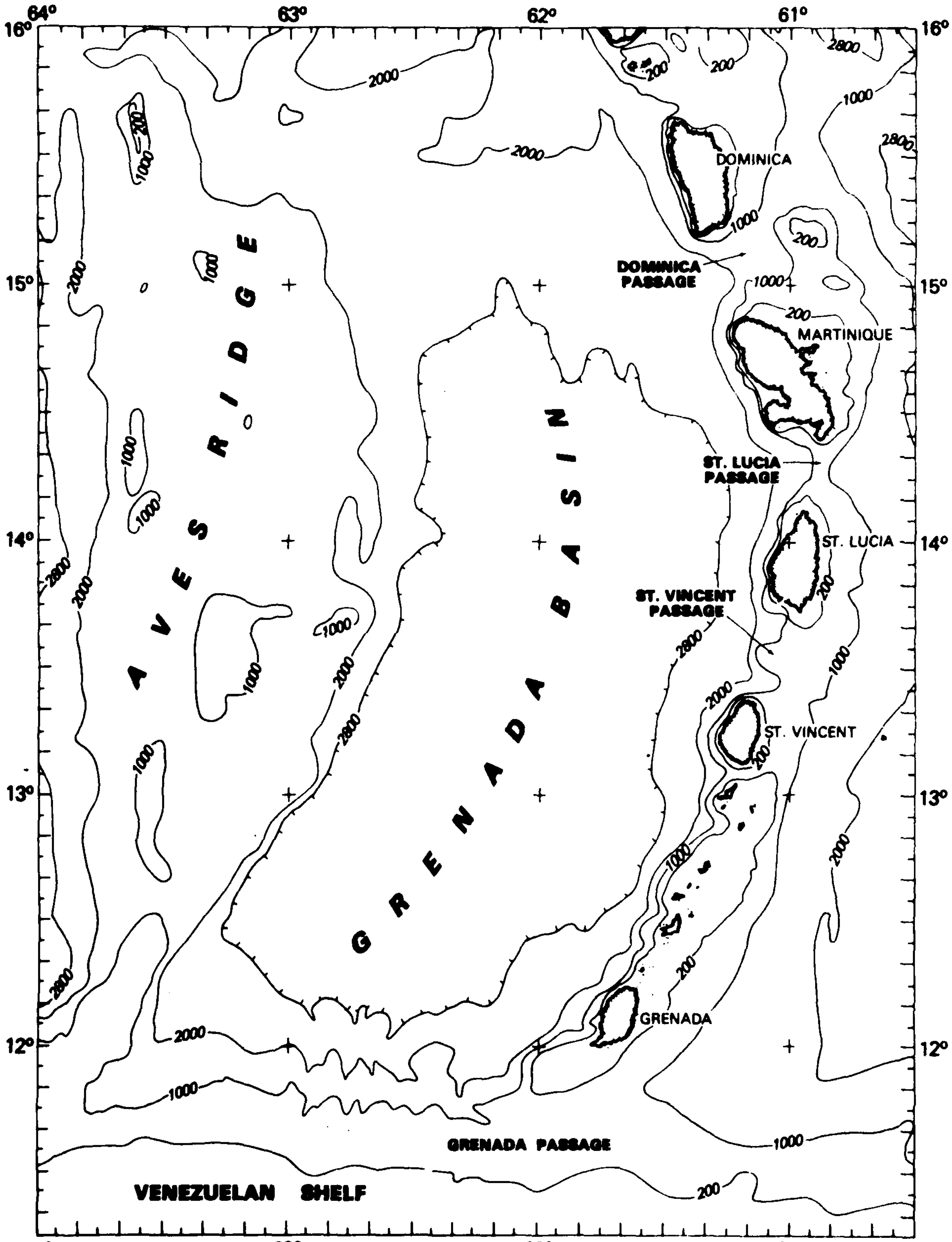


Figure 1. Southeastern Caribbean Sea (depth in meters).

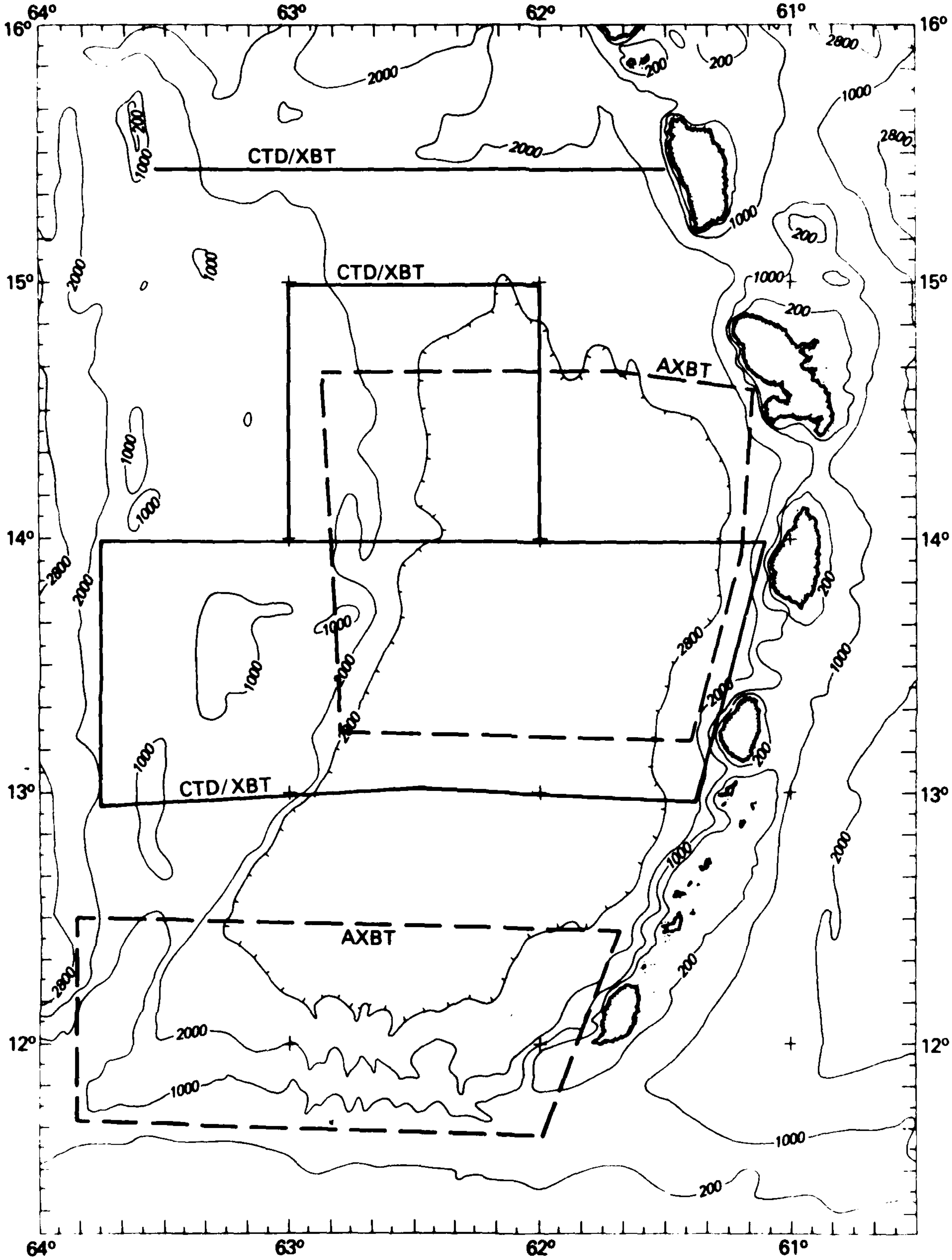


Figure 2. Ship and aircraft coverage in January 1980.

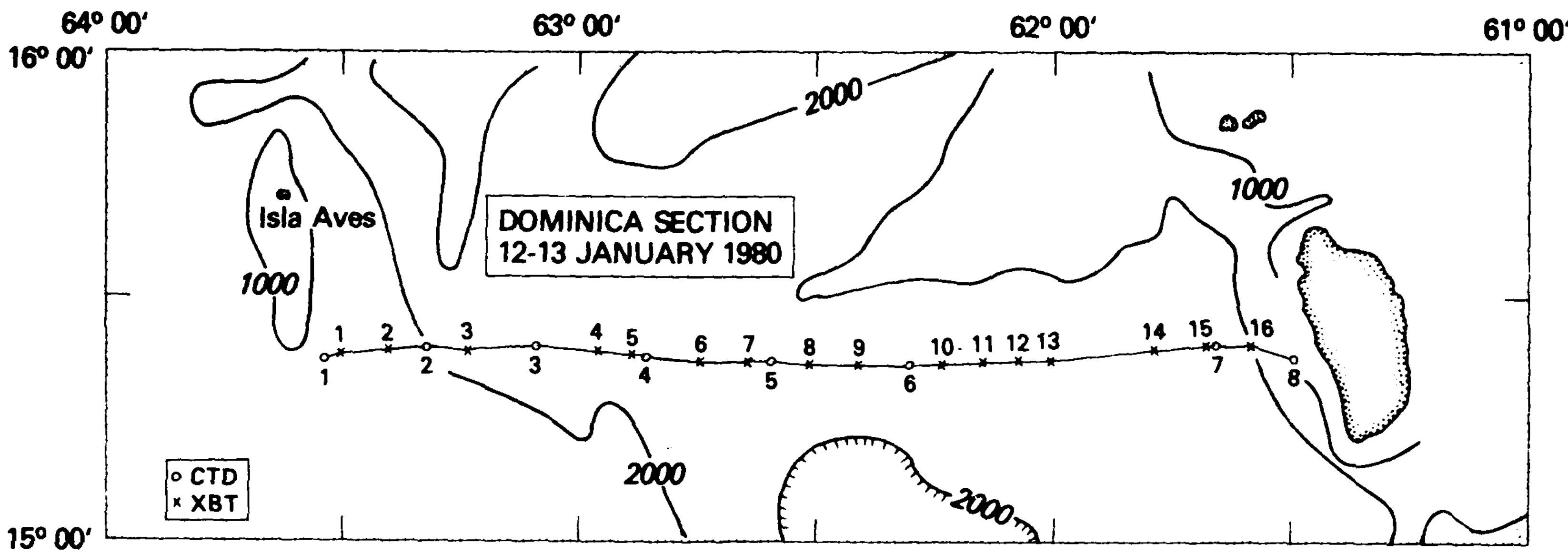


Figure 3. Dominica section.

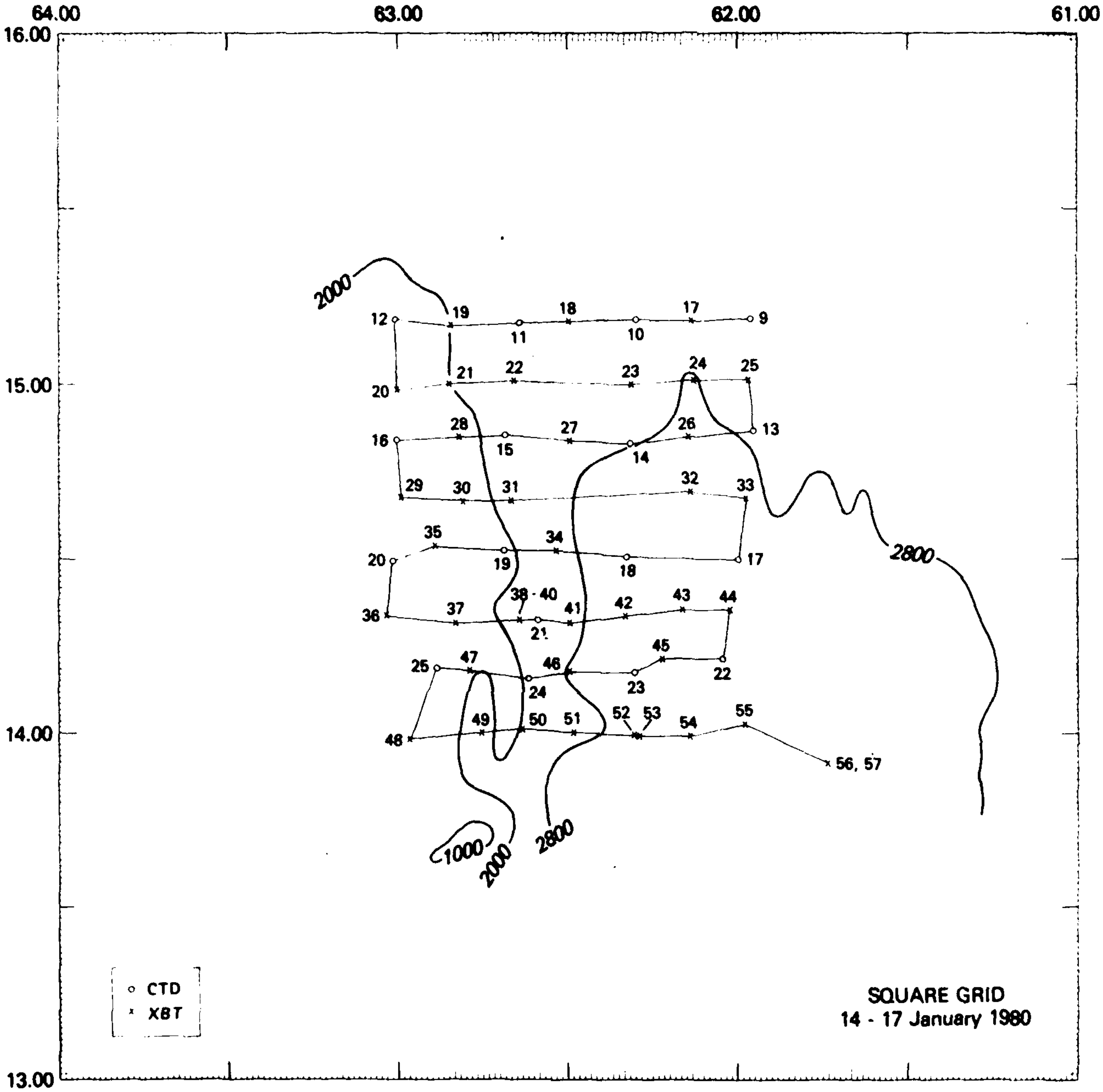


Figure 4. Square Grid.

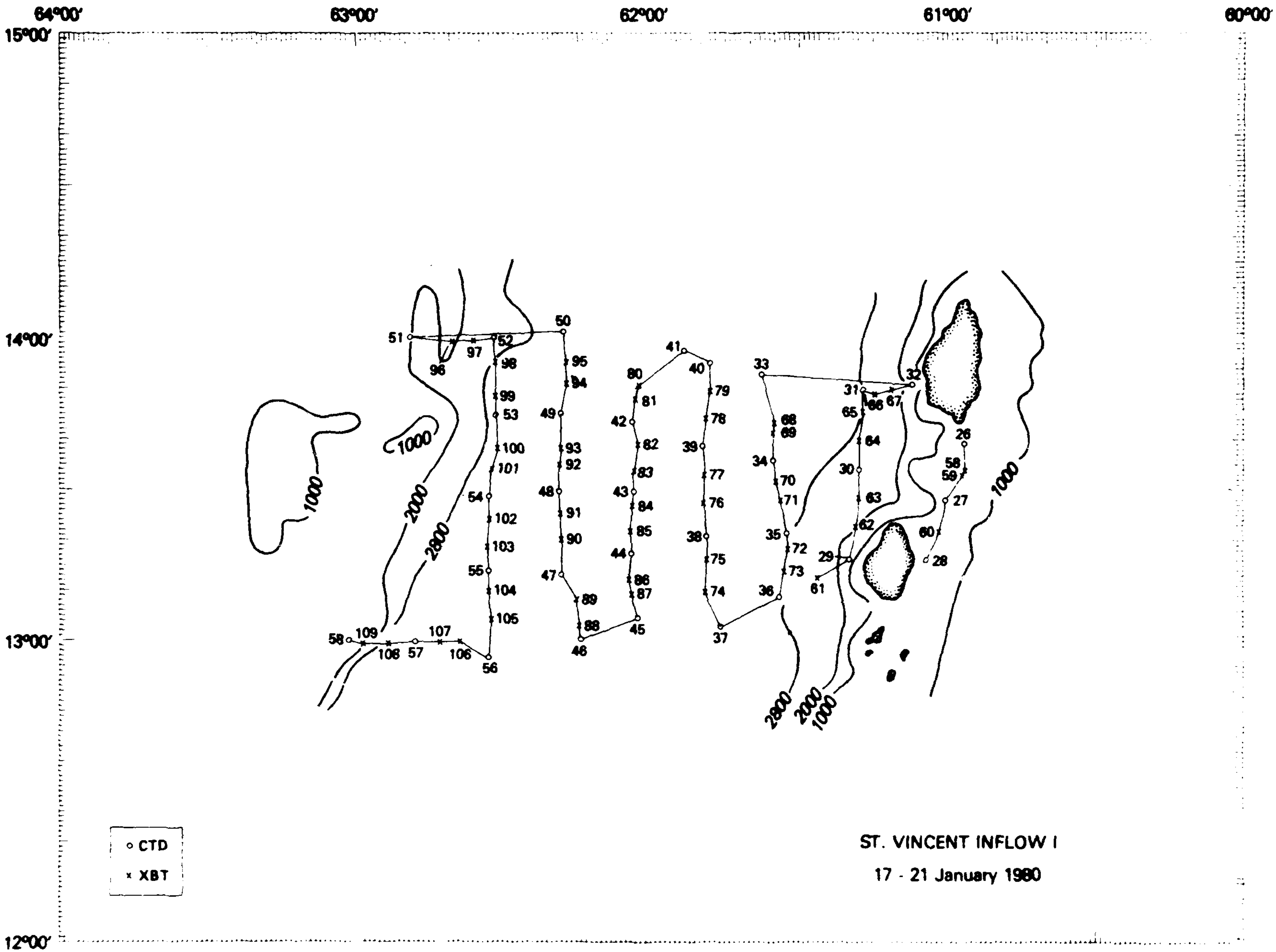


Figure 5. St. Vincent Inflow I.

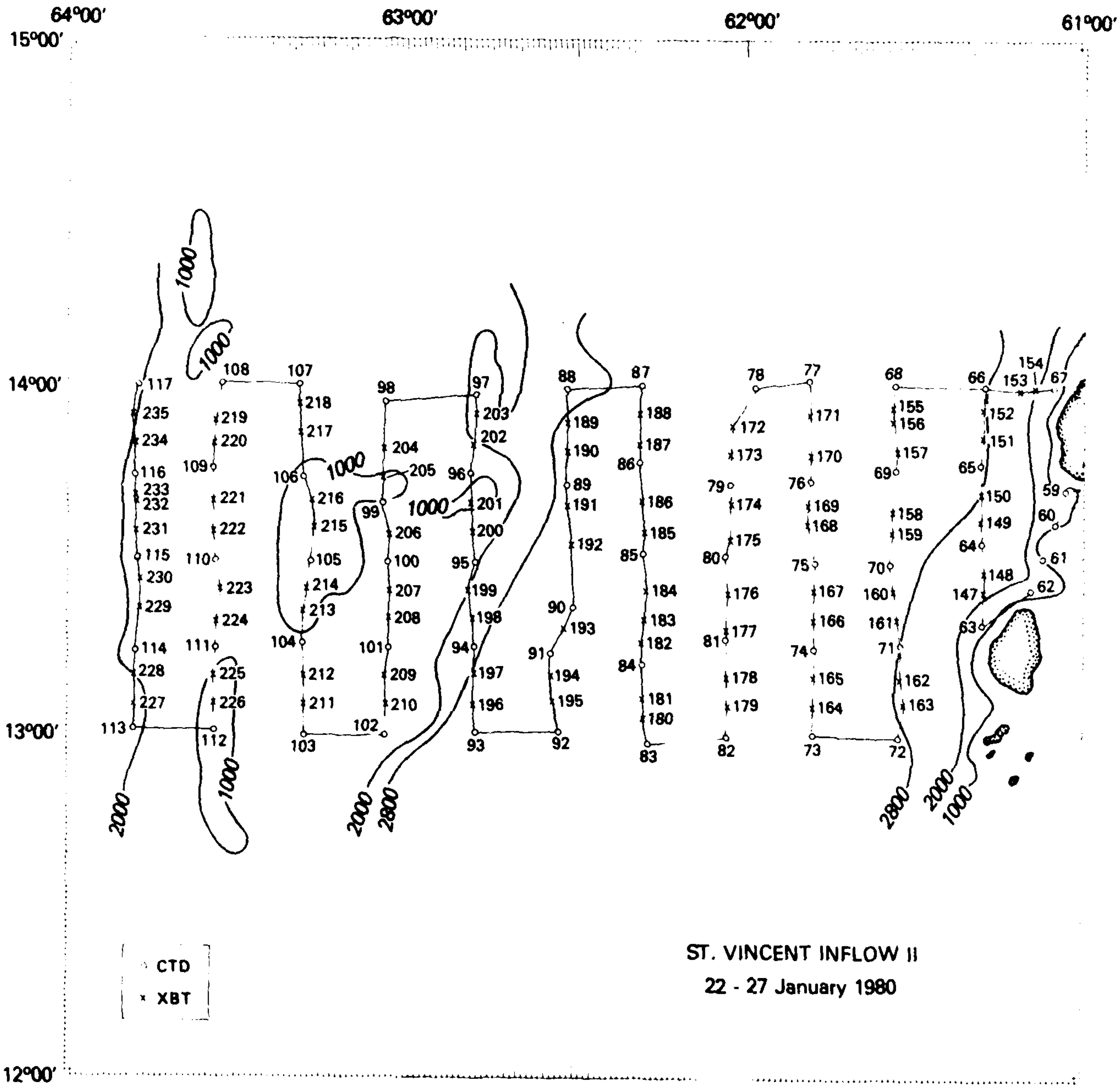


Figure 6. St. Vincent Inflow II.

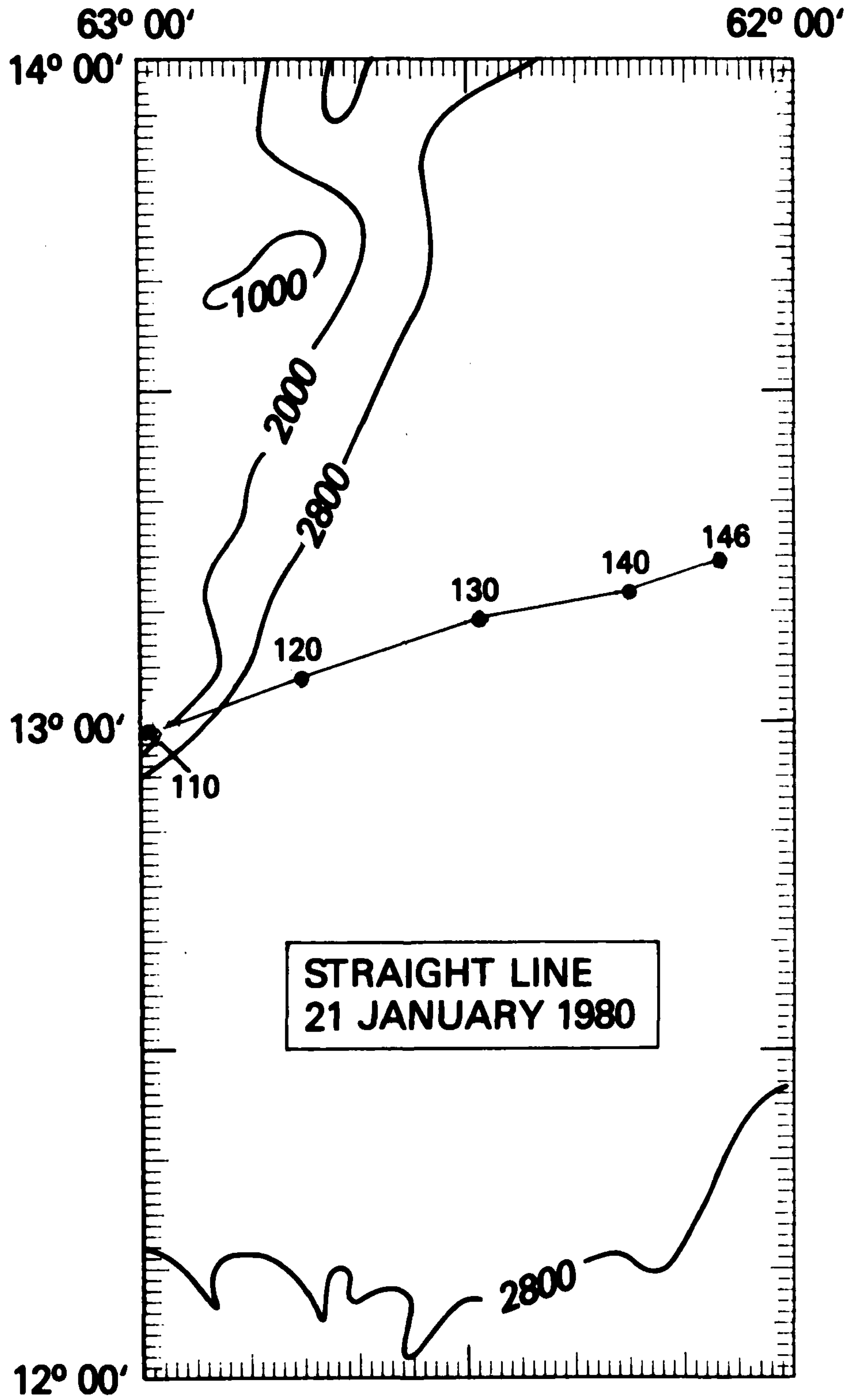


Figure 7. Straight Line.

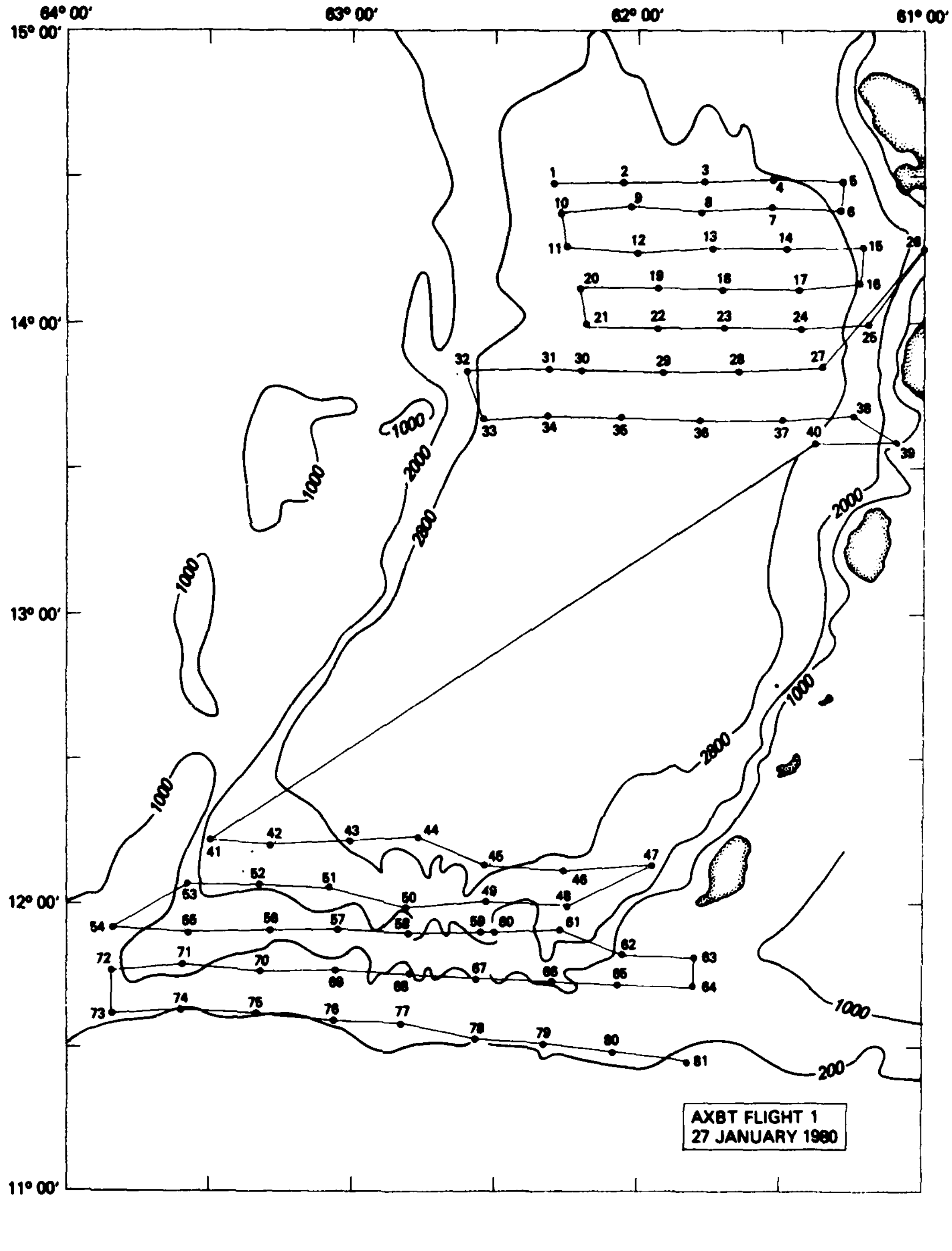


Figure 8. AXBT Flight 1.

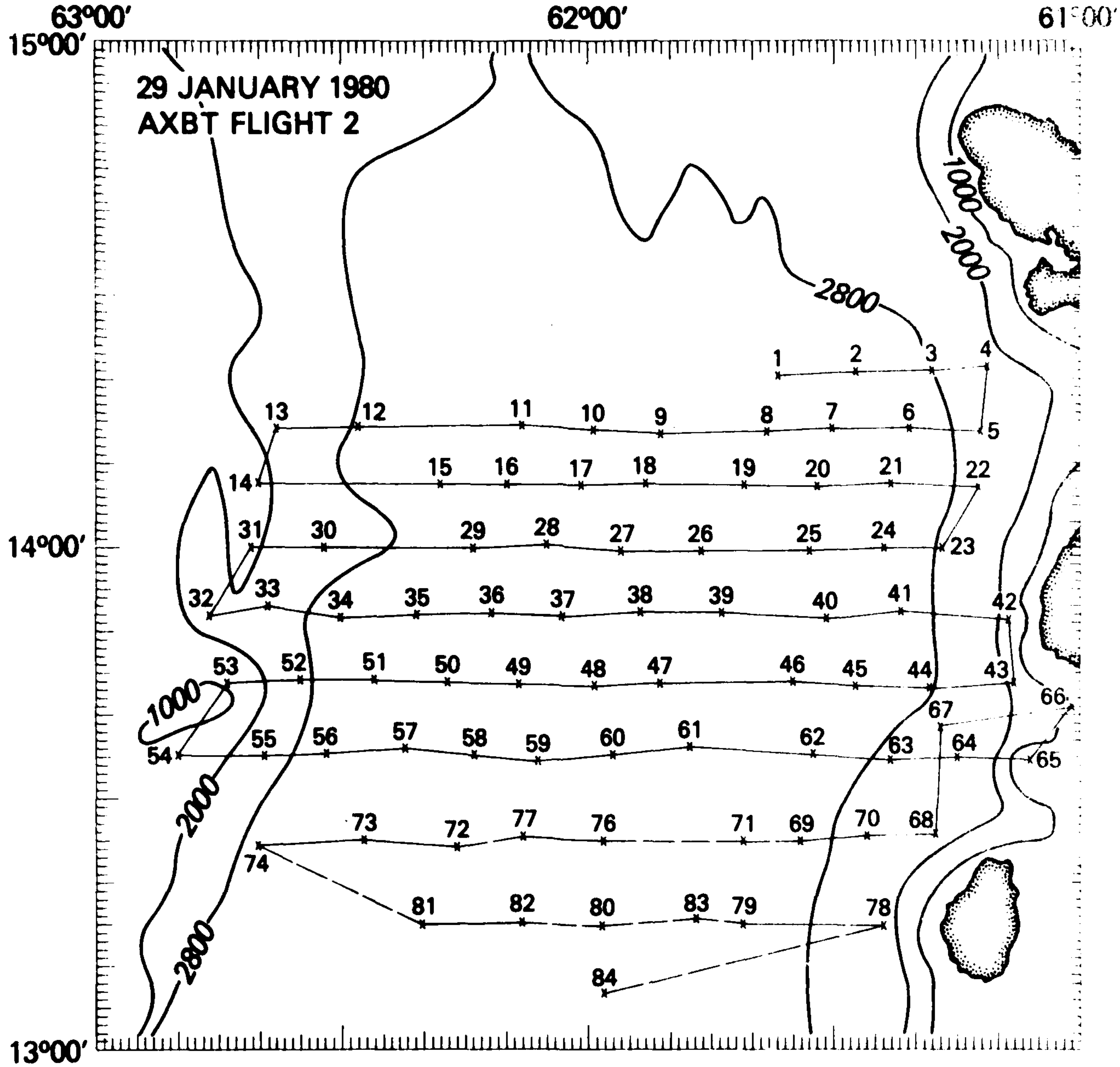


Figure 9. AXBT Flight 2.

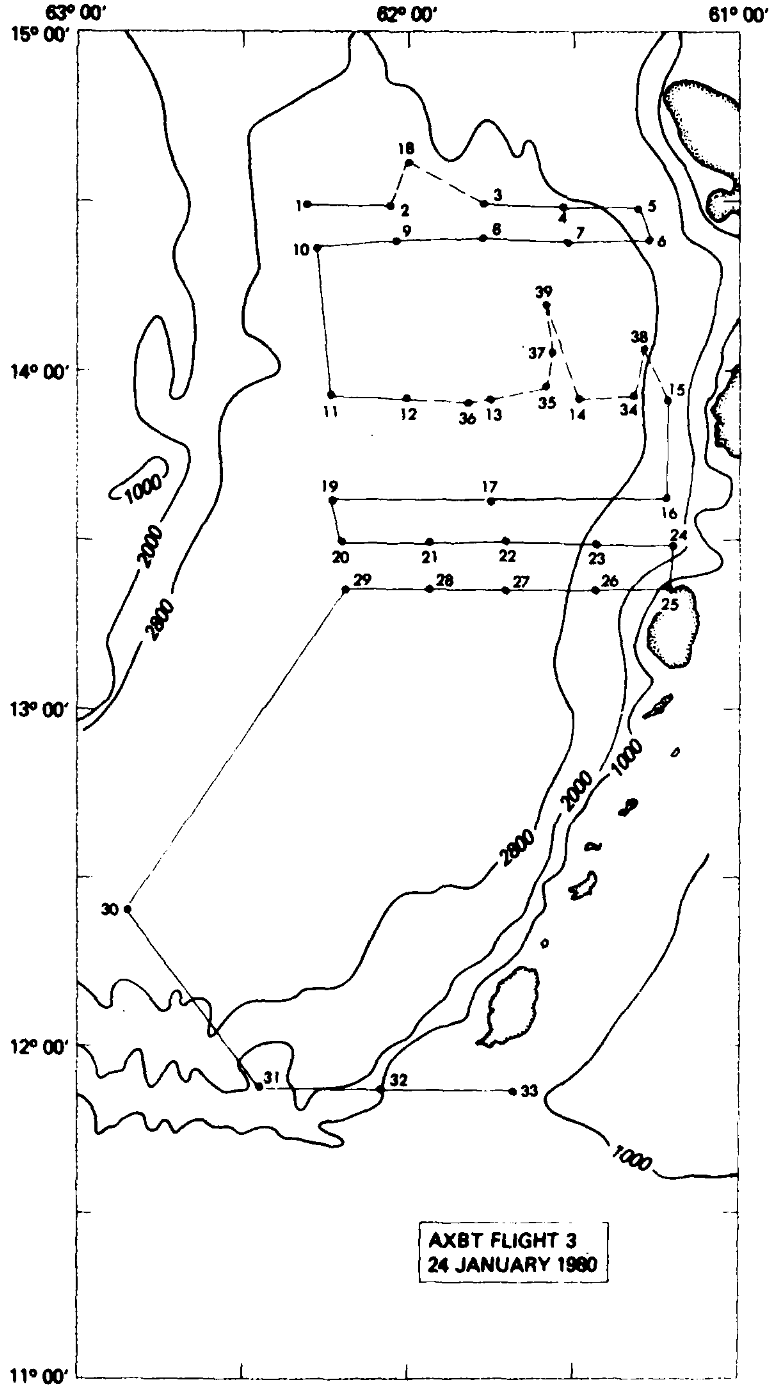


Figure 10. AXBT Flight 3.

Vertical Profiles, Stations 1-117

Figures 11 - 241, Odd Numbers
(less 23)

and

TS Diagrams, Stations 1-117

Figures 12 - 242, Even Numbers
(less 23)

GRENADA BASIN
STATION 001001
JANUARY 1980

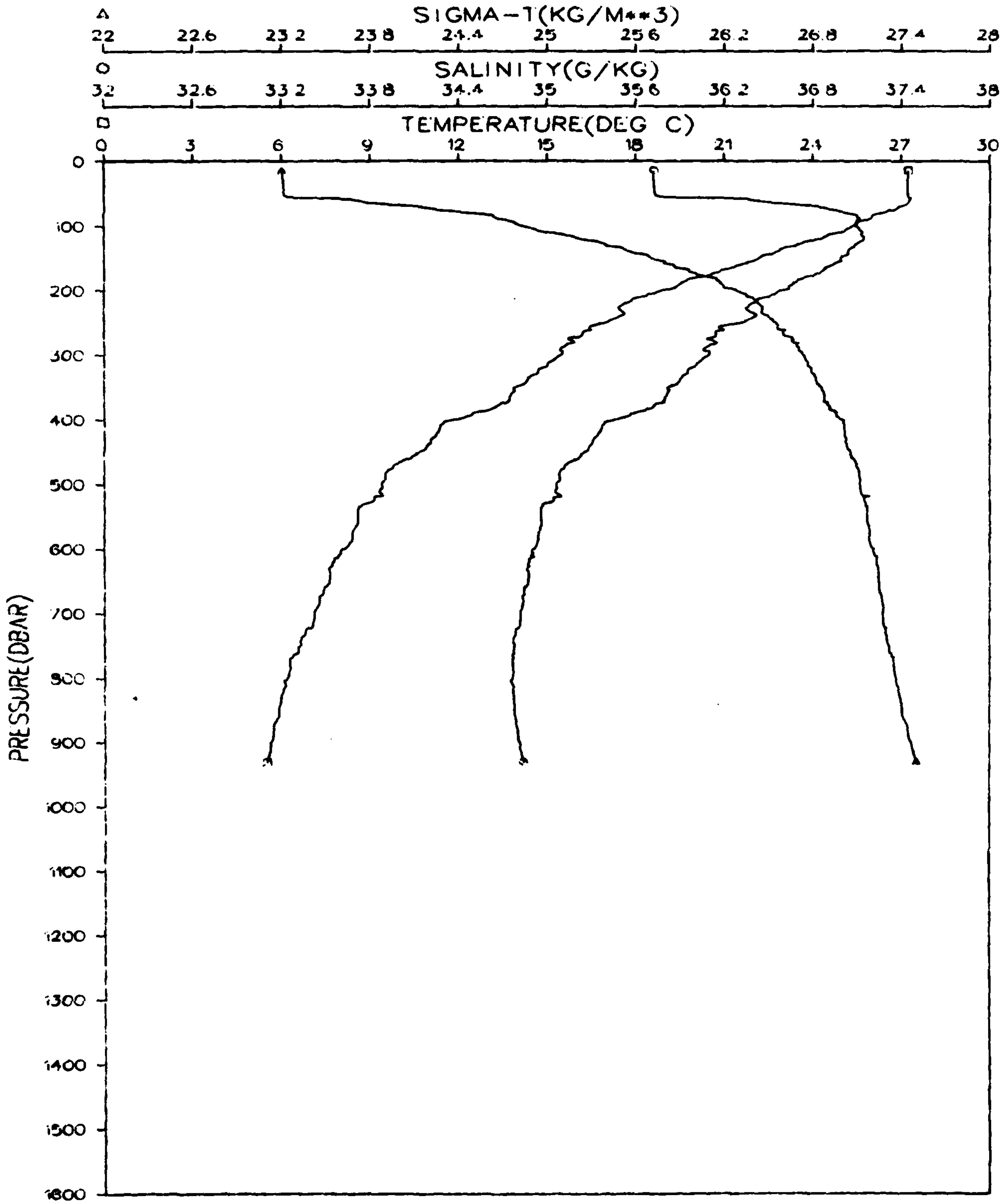


Figure 11.

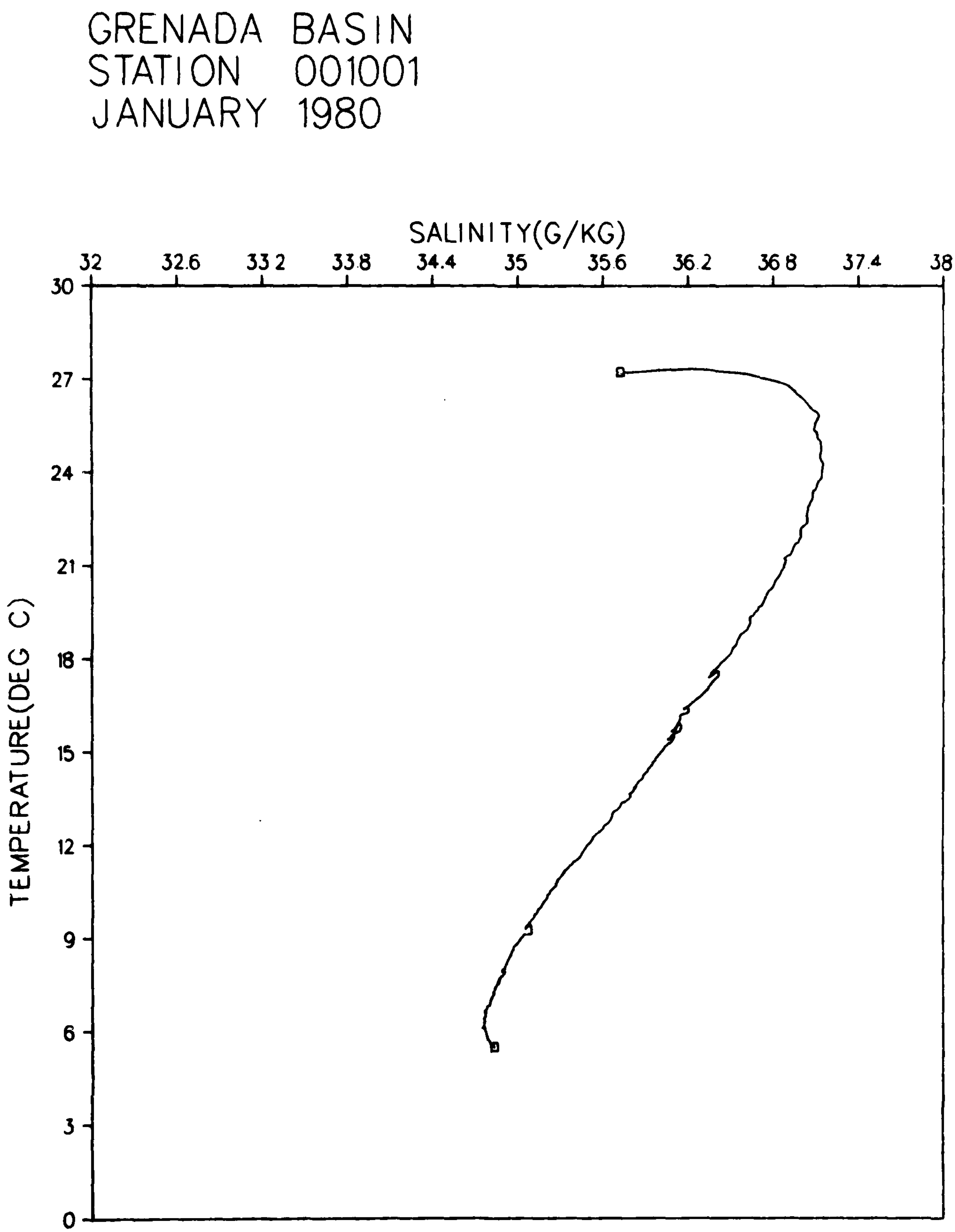

GRENADA BASIN
STATION 001001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 12.

GRENADA BASIN
STATION 002001
JANUARY 1980

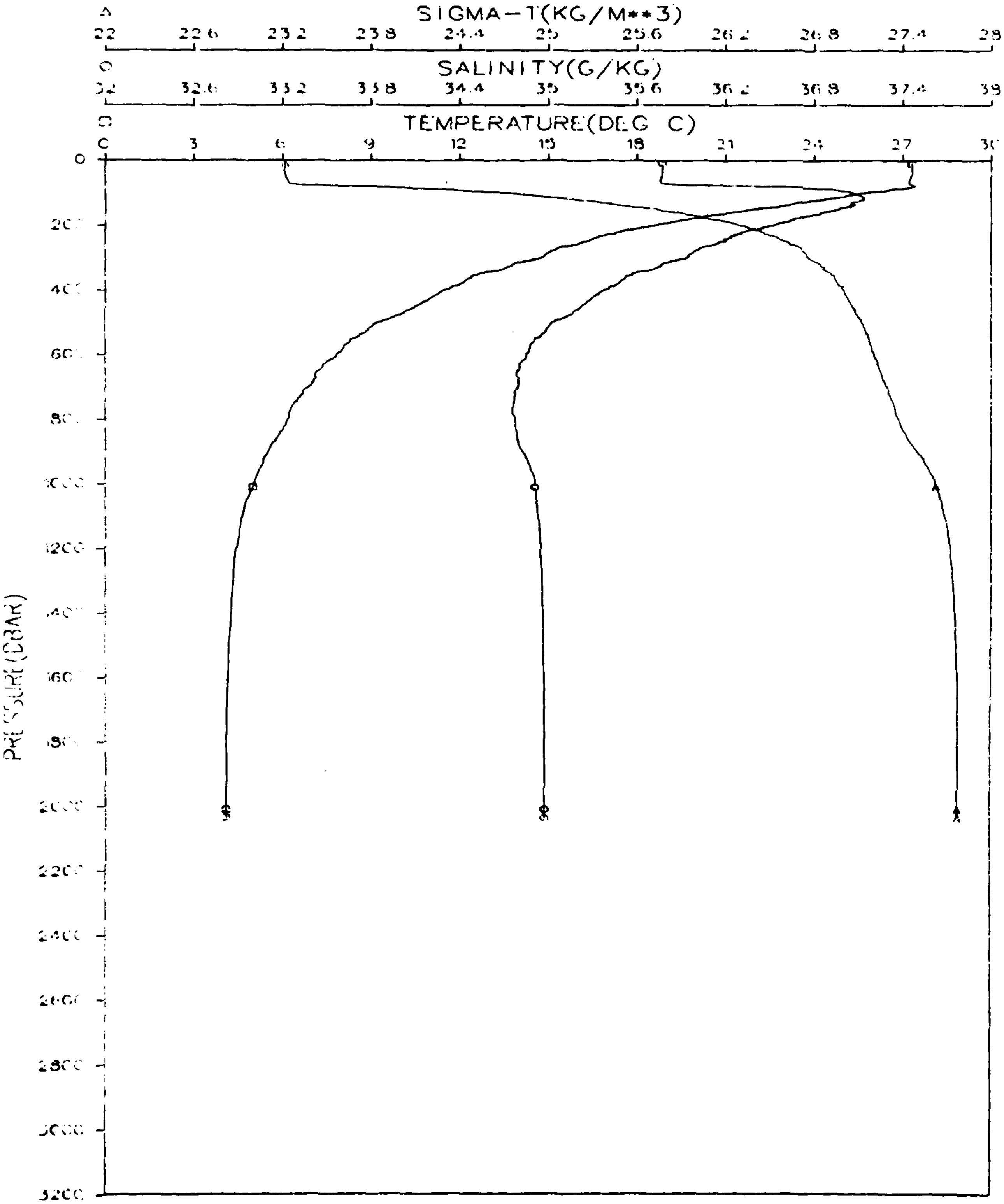


Figure 13.

GRENADA BASIN
STATION 002001
JANUARY 1980

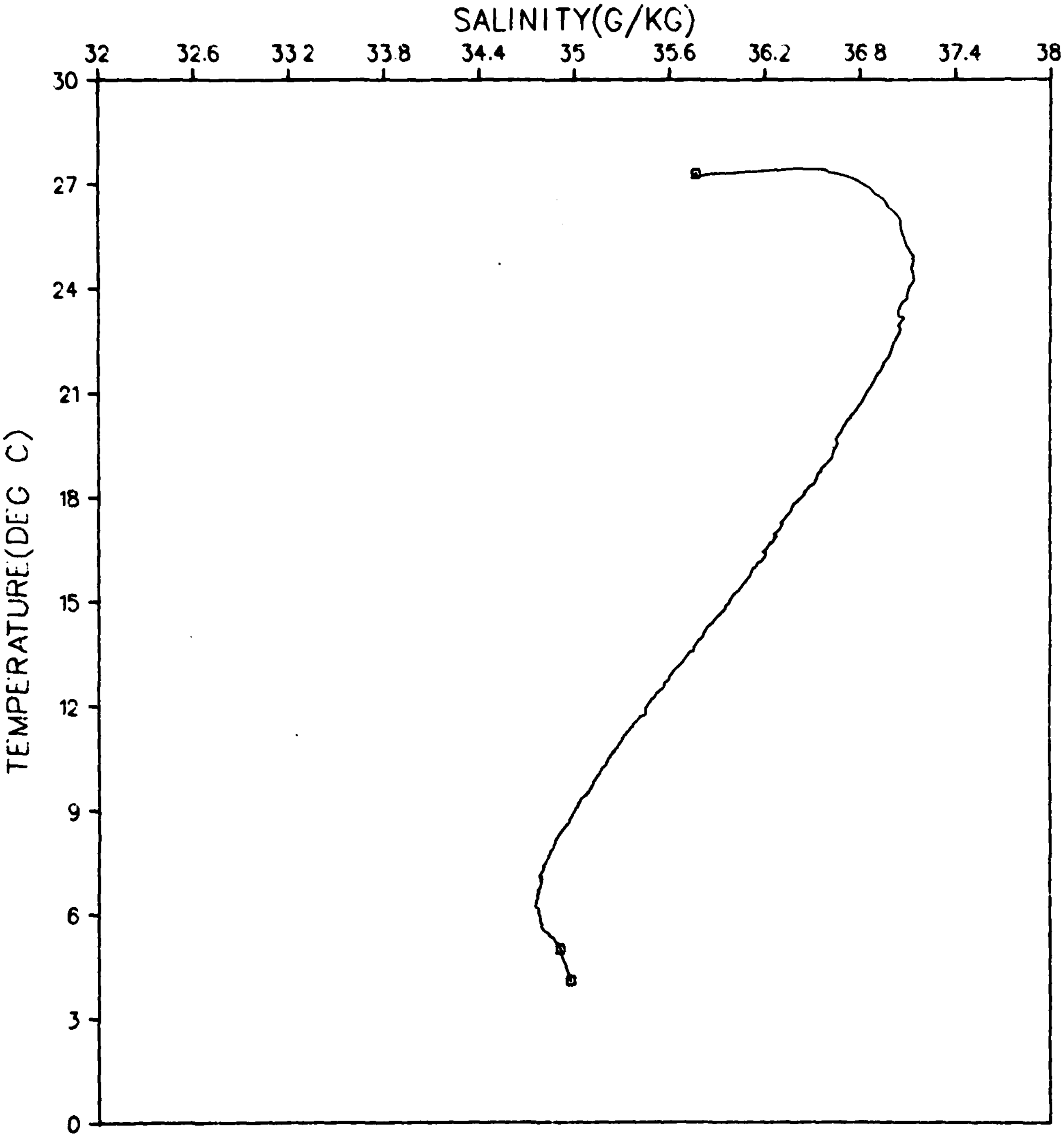
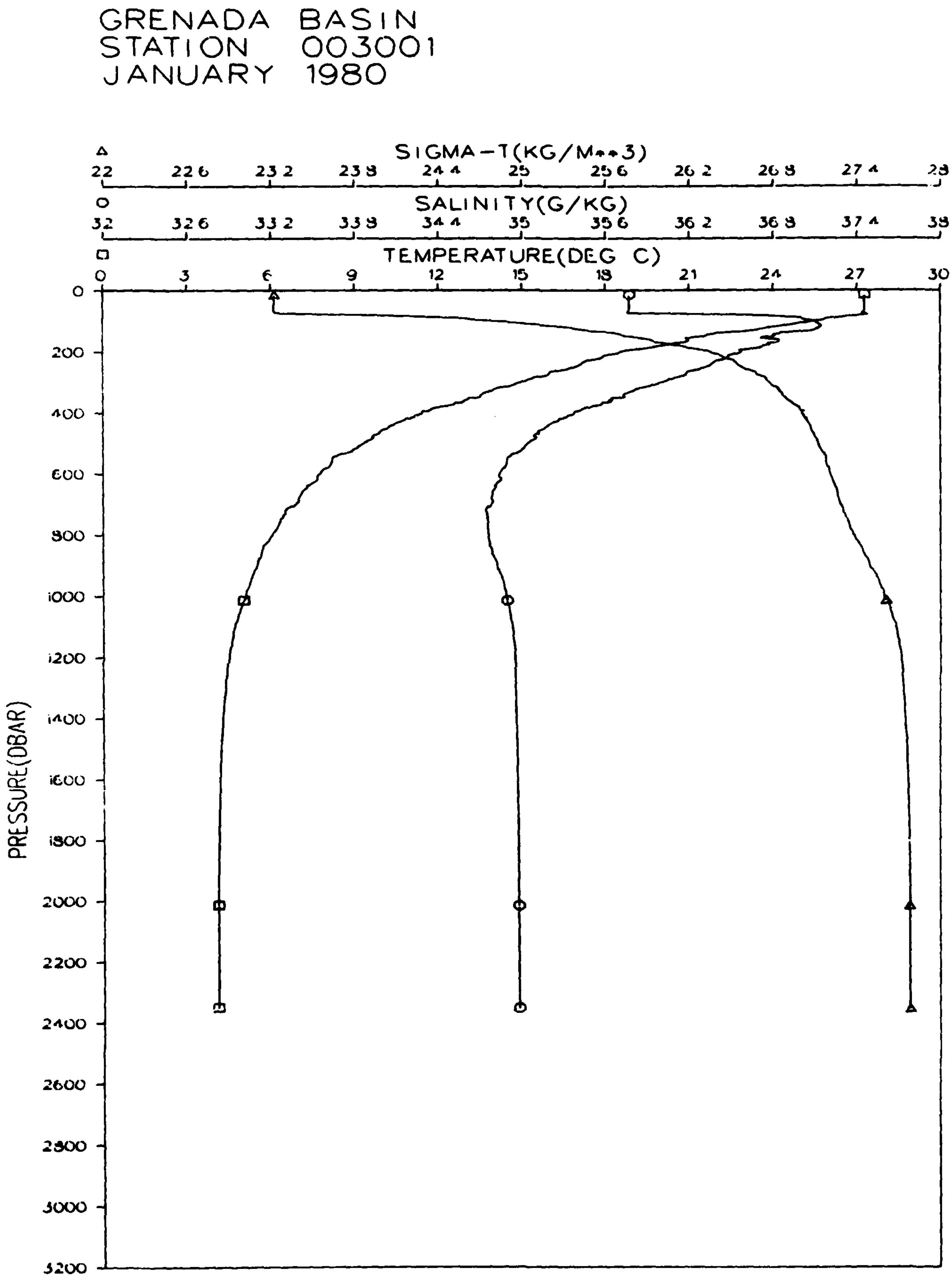


Figure 14.



GRENADA BASIN
STATION 003001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200

Figure 15.

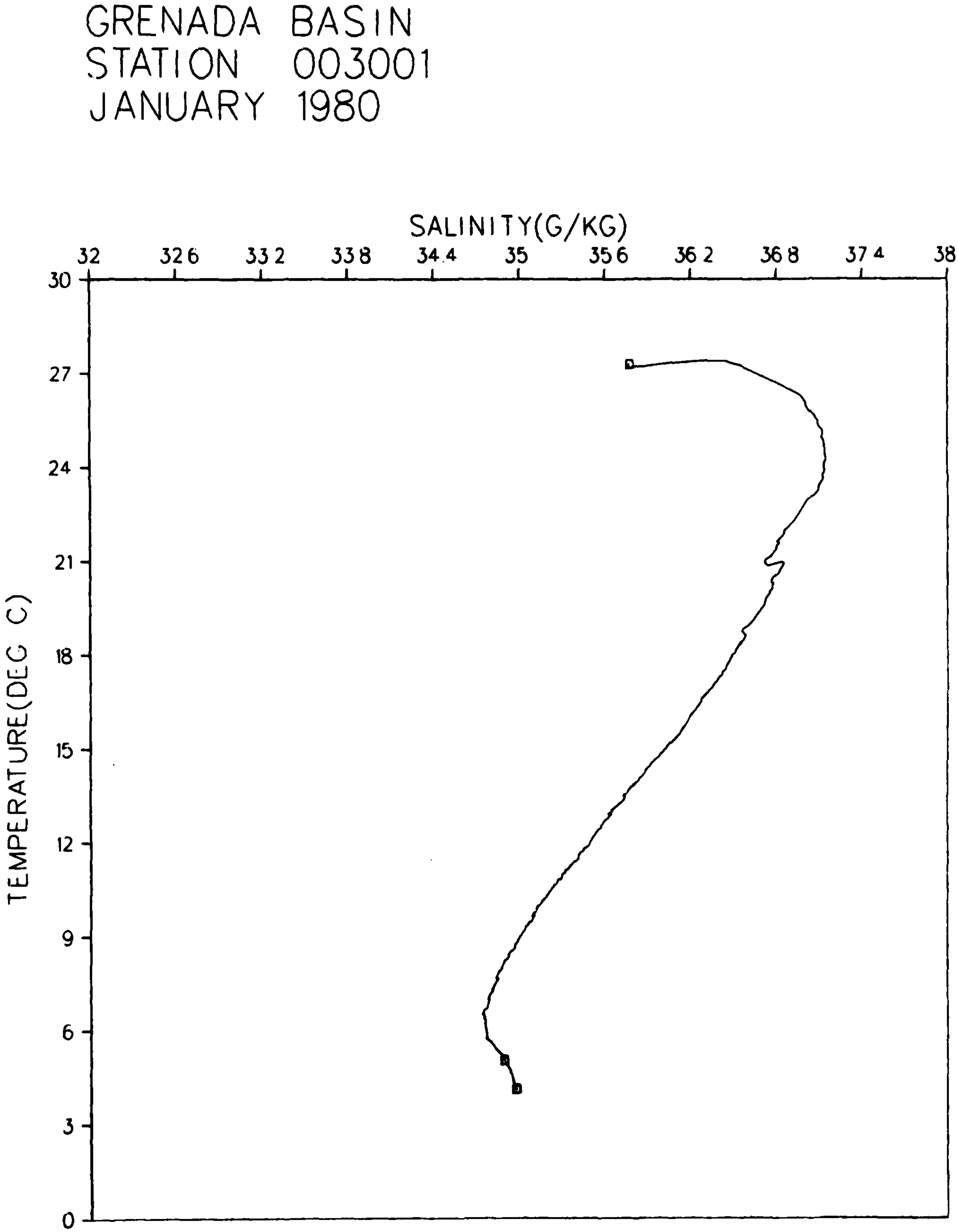

GRENADA BASIN
STATION 003001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 16.

GRENADA BASIN
STATION 004001
JANUARY 1980

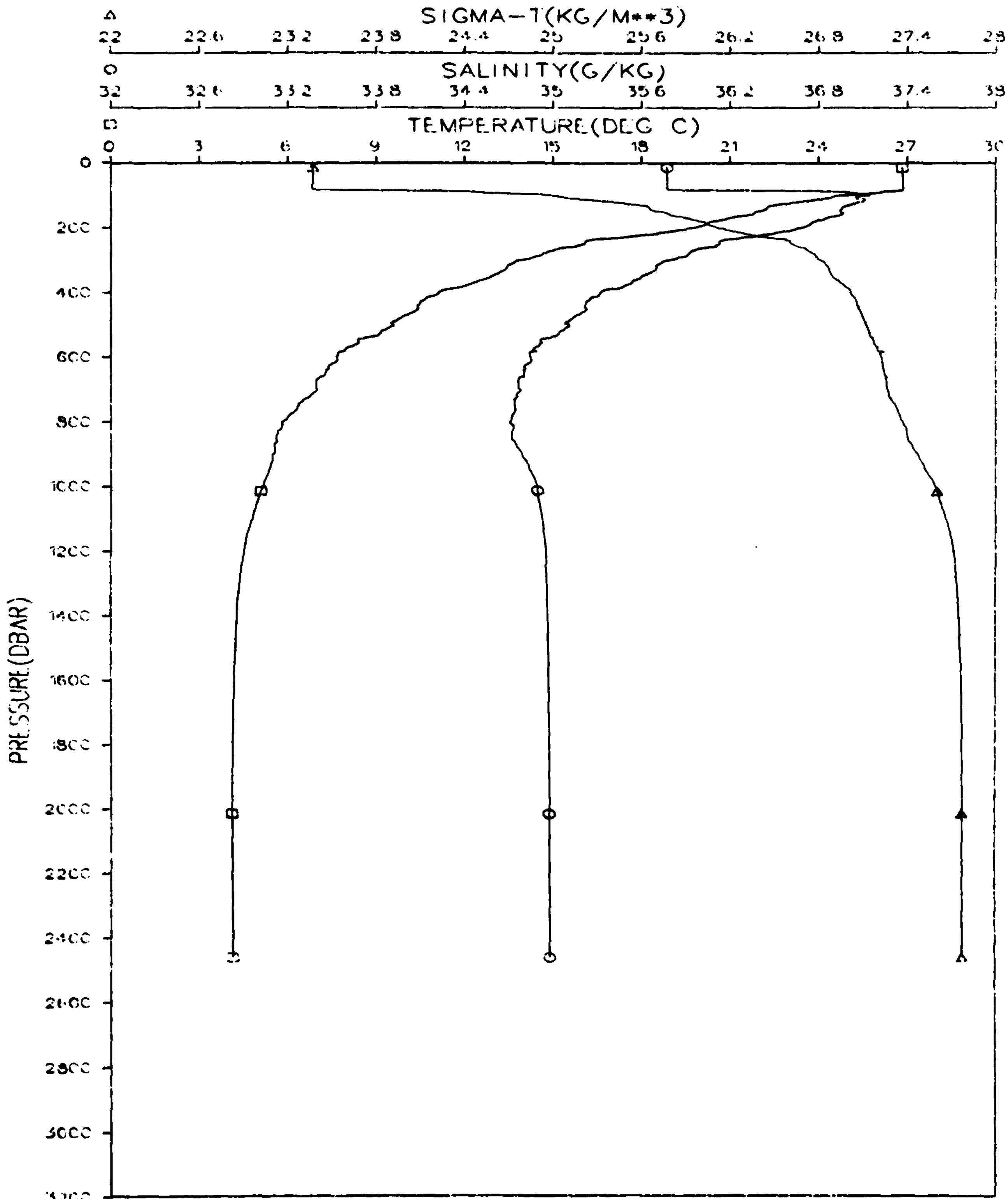
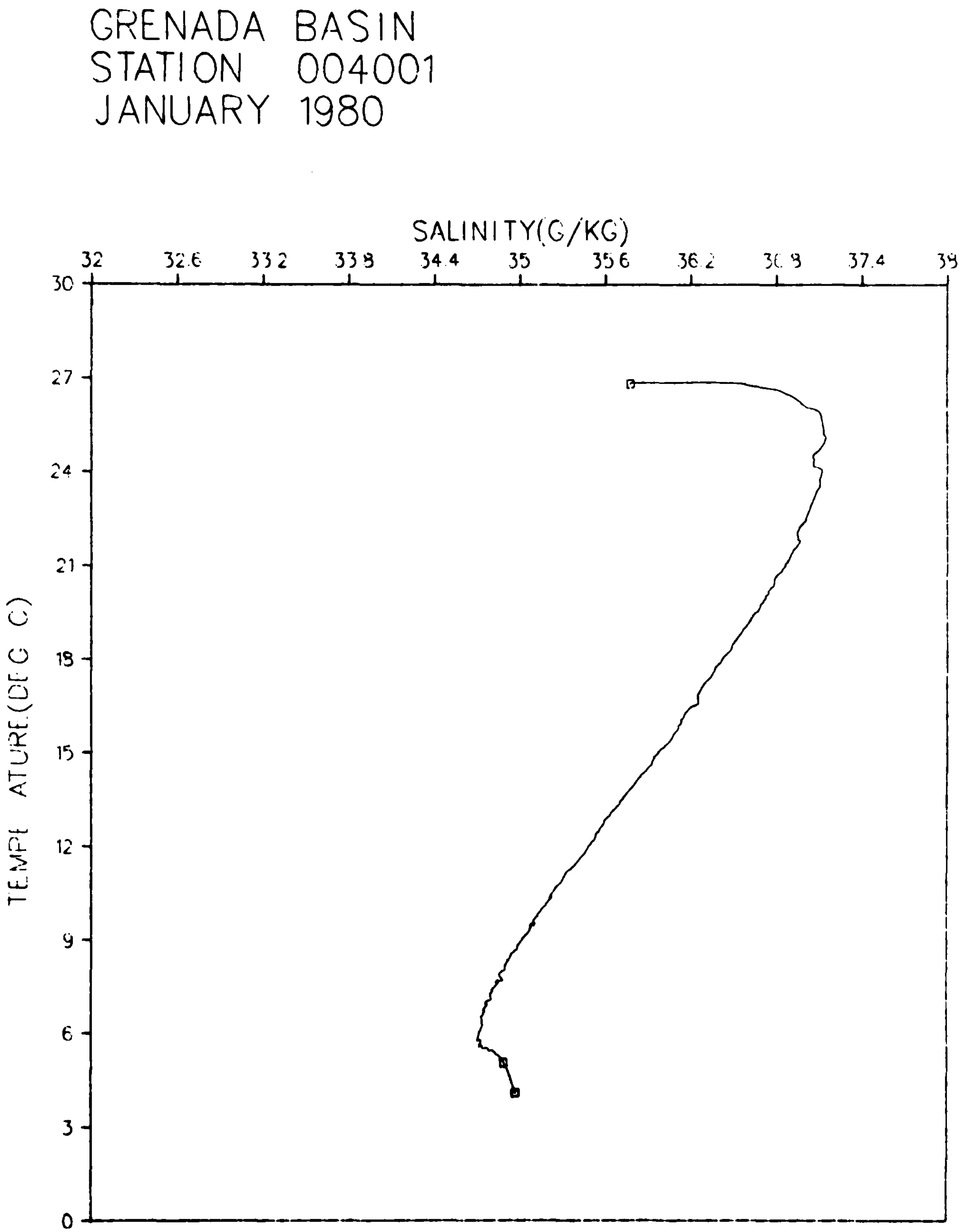


Figure 17.



GRENADA BASIN
STATION 004001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
37.4
30
27
24
21
18
15
12
9
6
3
0
TEMPERATURE(DEG C)

Figure 18.

GRENADA BASIN
STATION 005001
JANUARY 1980

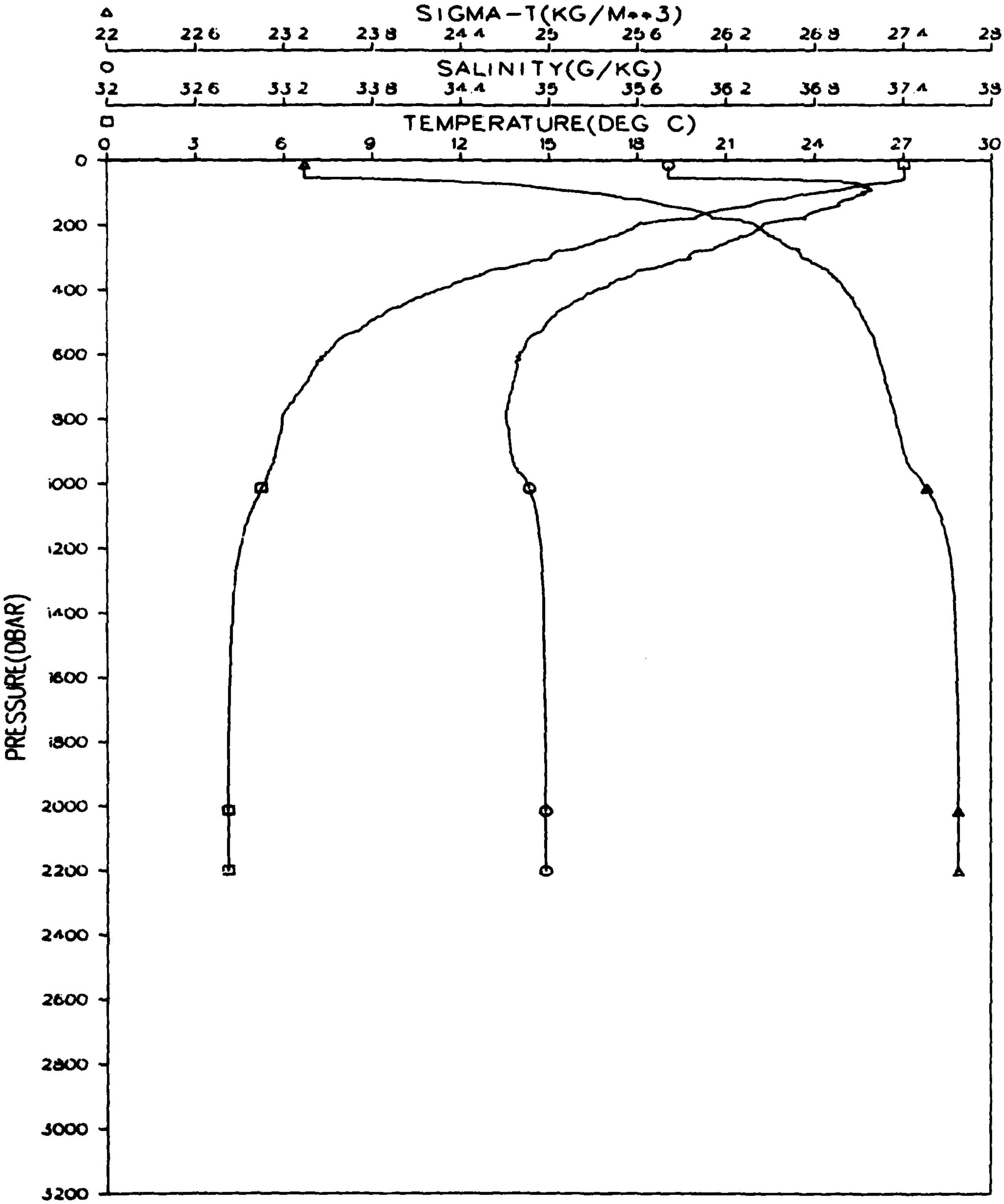


Figure 19.

GRENADA BASIN
STATION 005001
JANUARY 1980

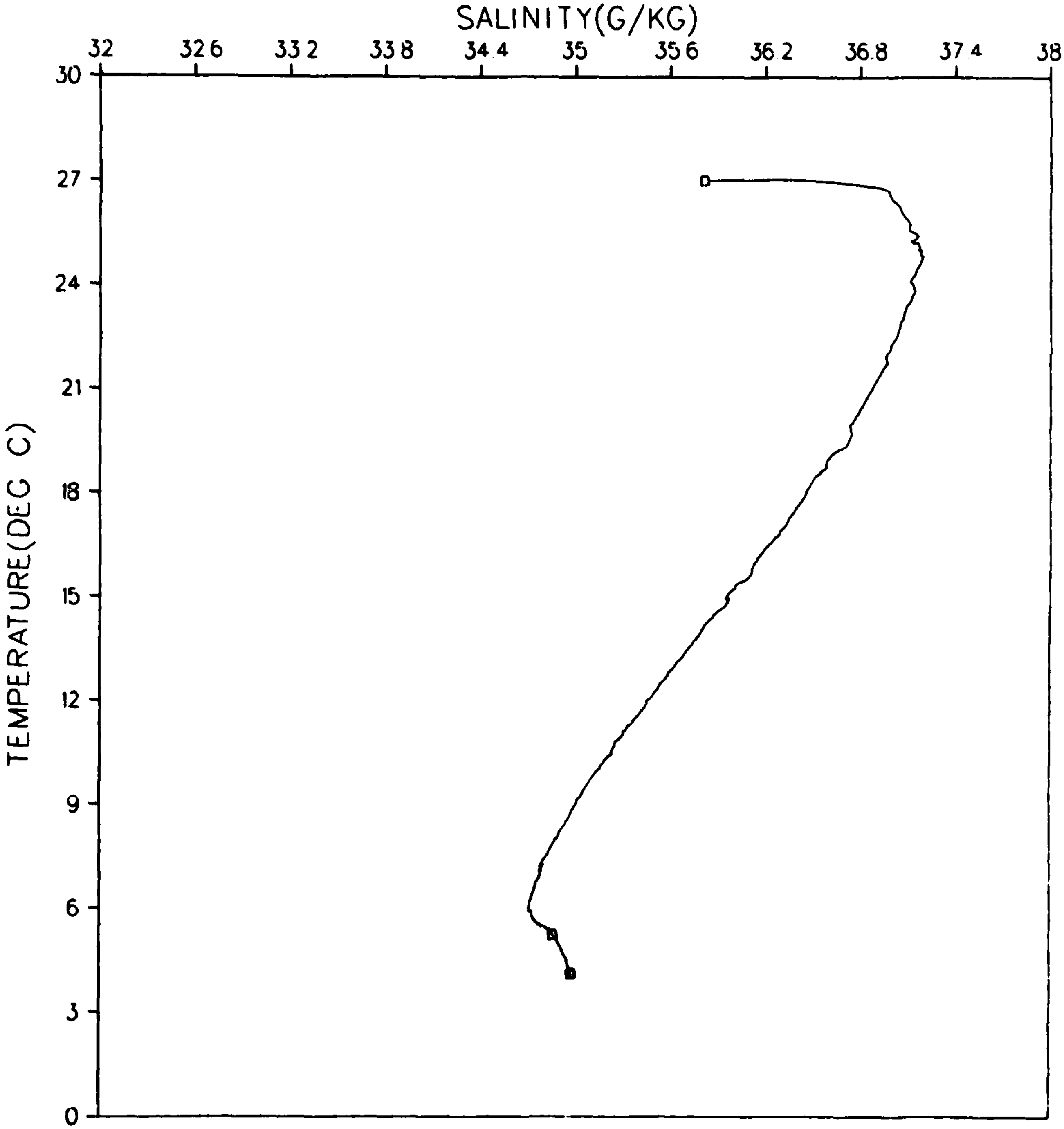


Figure 20.

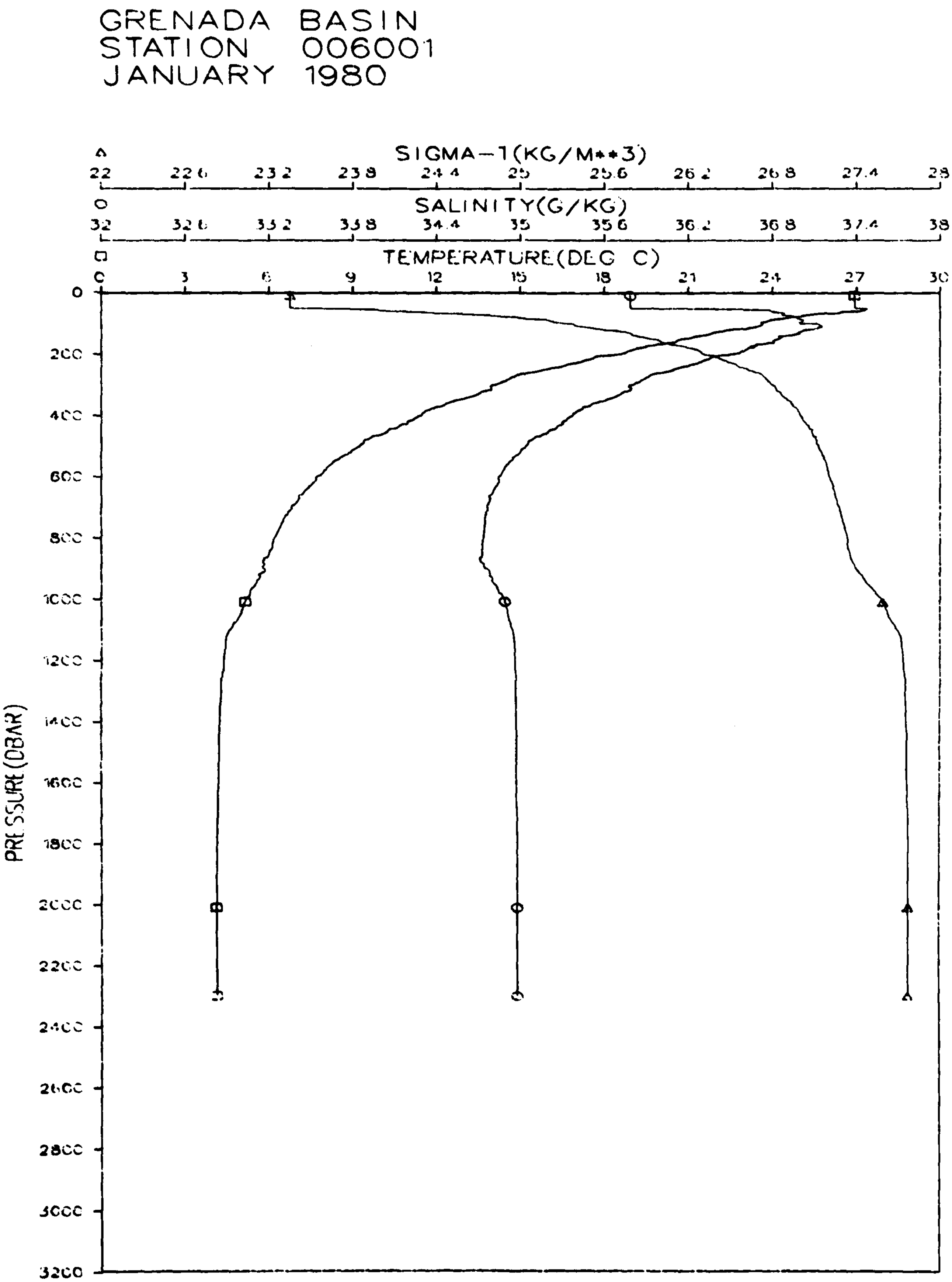

GRENADA BASIN
STATION 006001
JANUARY 1980
SIGMA-1(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200

Figure 21.

GRENADA BASIN
STATION 006001
JANUARY 1980

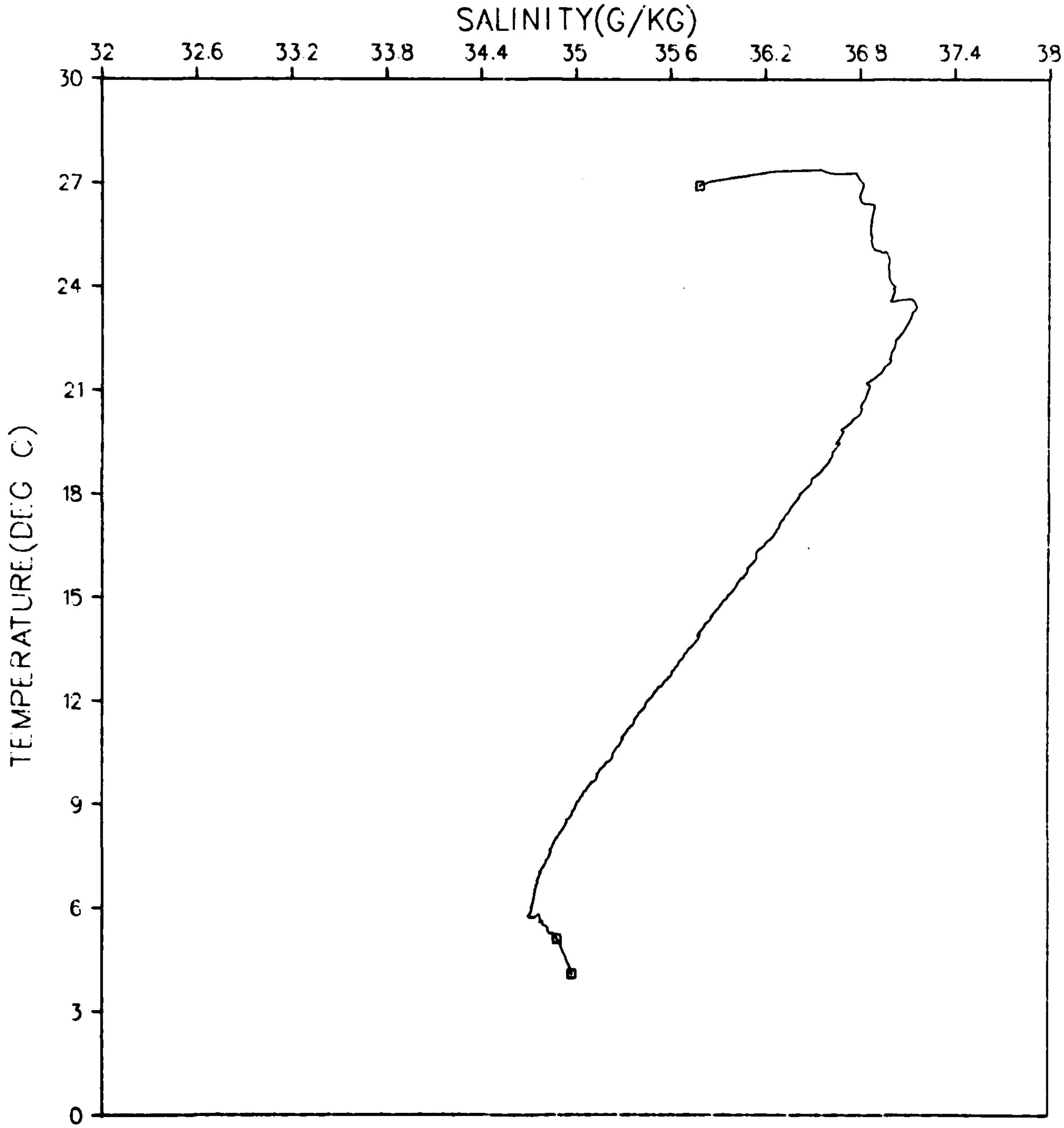


Figure 22.

GRENADA BASIN
STATION 007001
JANUARY 1980

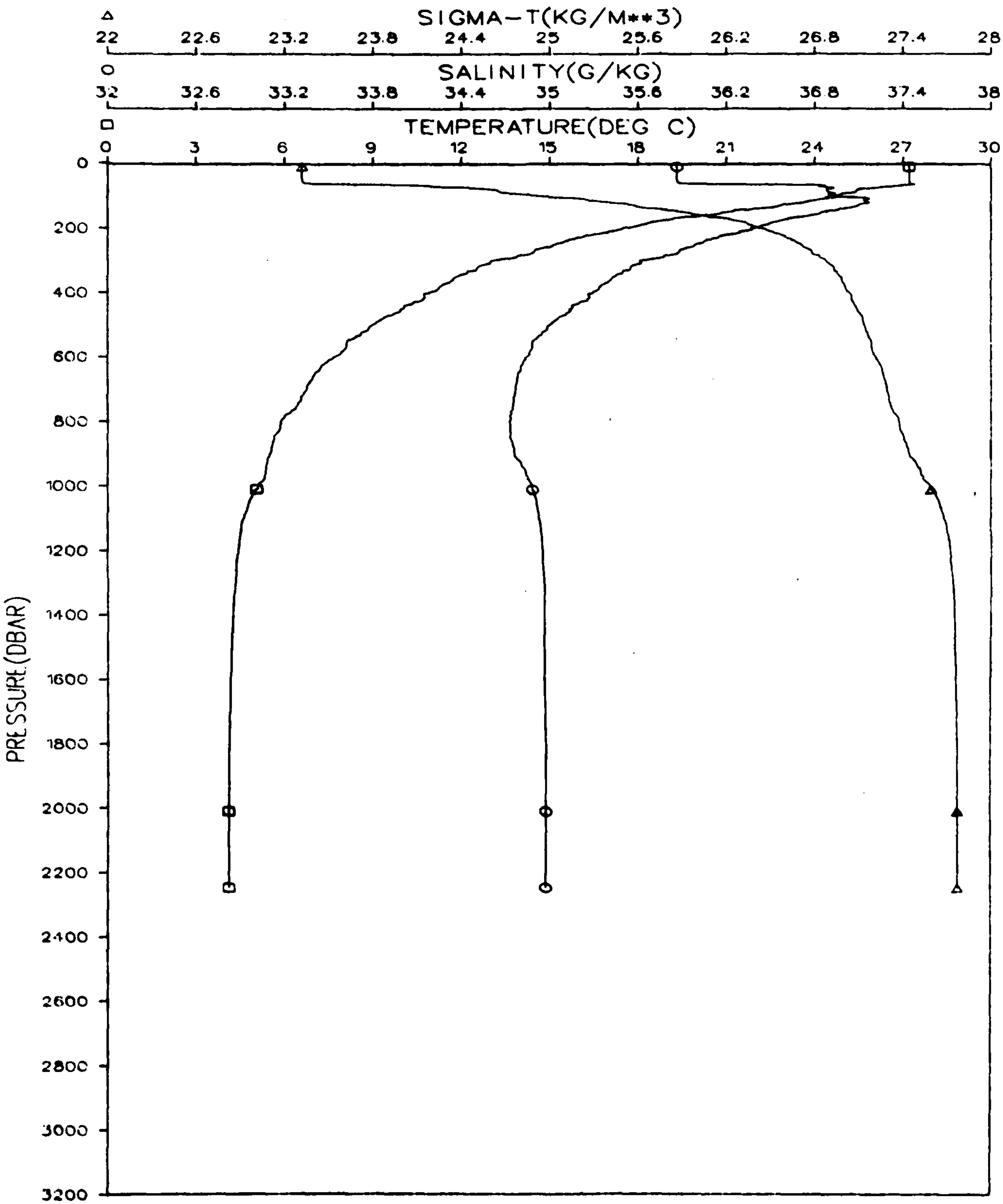


Figure 23.

GRENADA BASIN
STATION 007001
JANUARY 1980

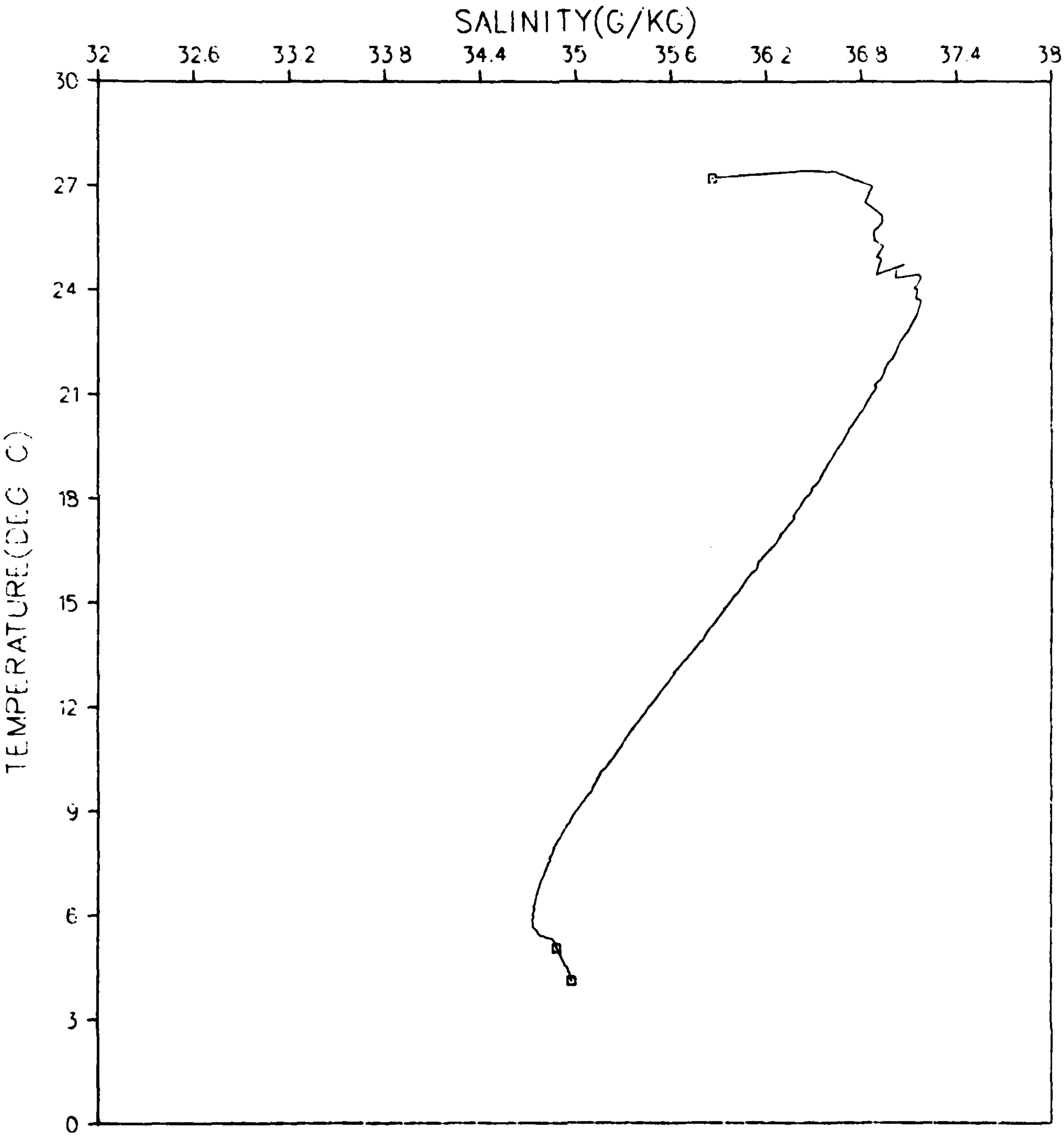


Figure 24.

GRENADA BASIN
STATION 008001
JANUARY 1980

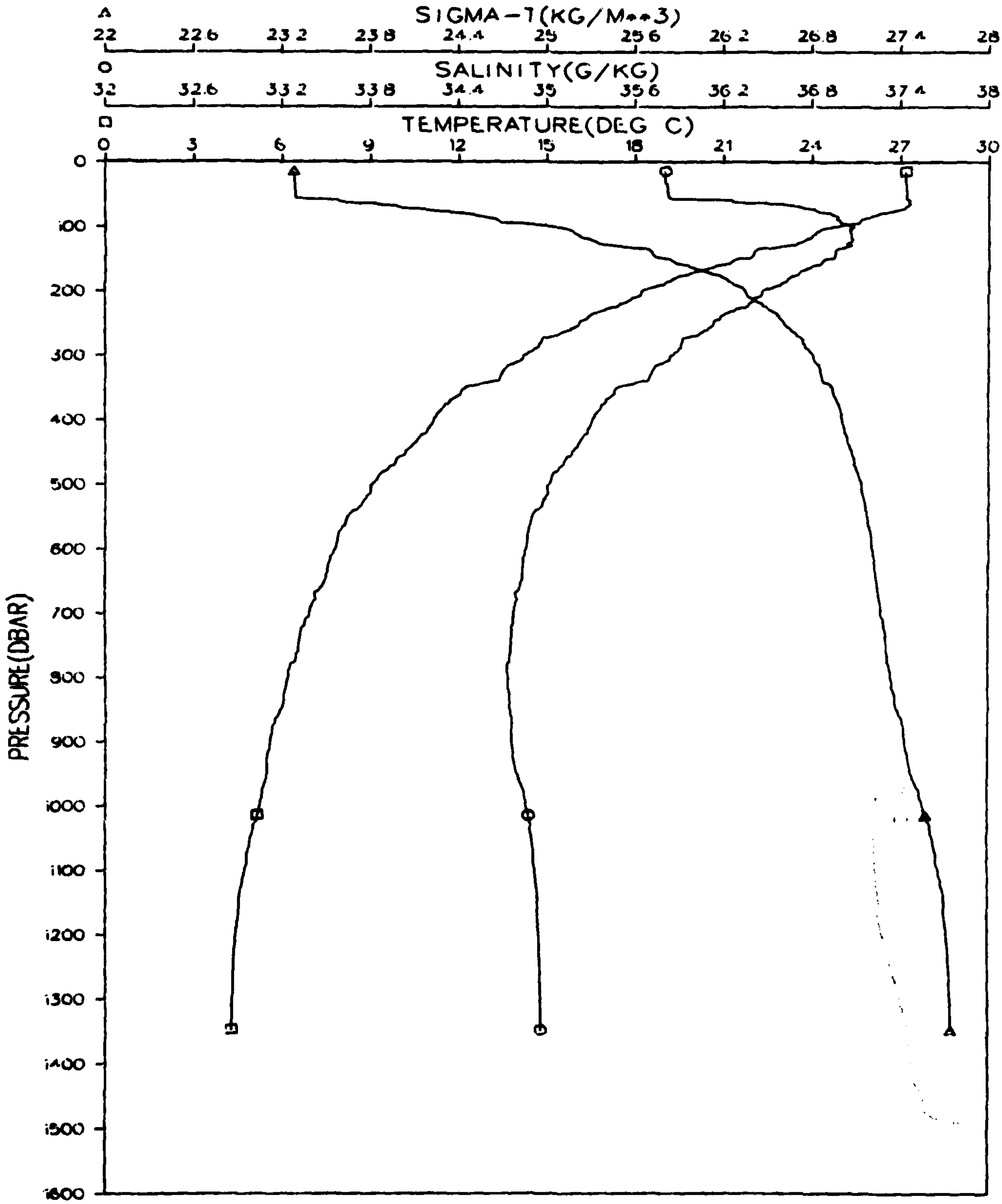


Figure 25.

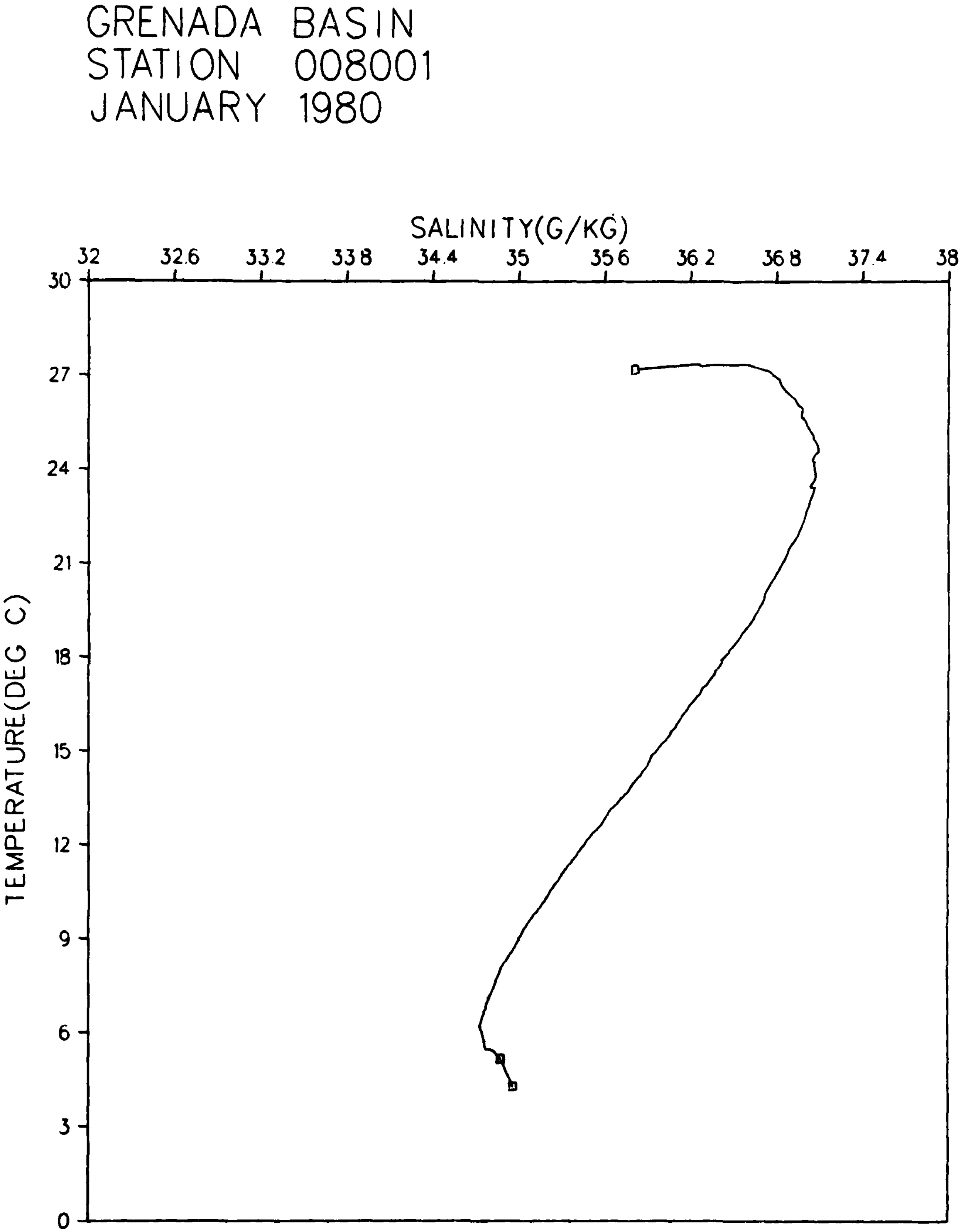

GRENADA BASIN
STATION 008001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 26.

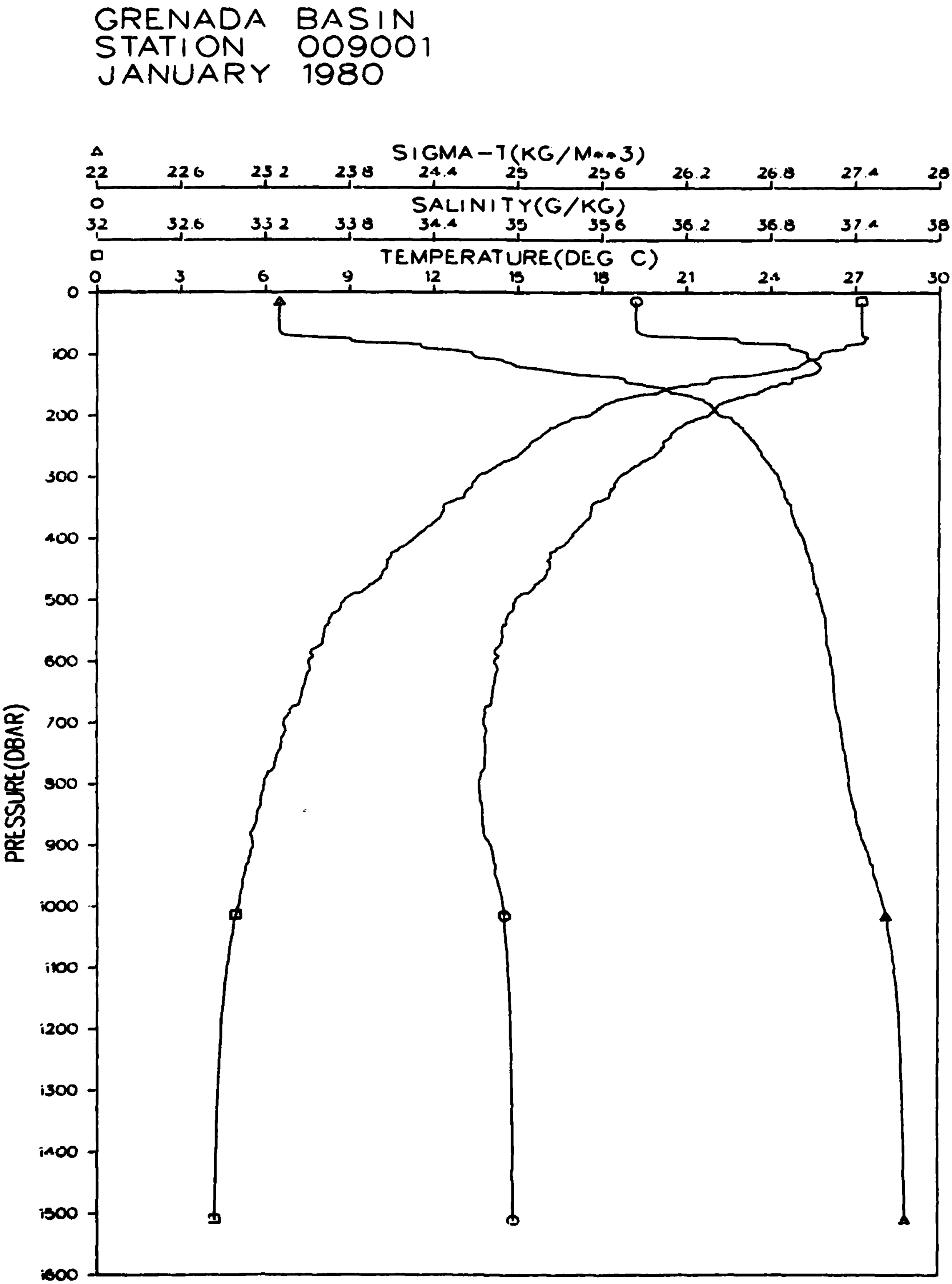

GRENADA BASIN
STATION 009001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 27.

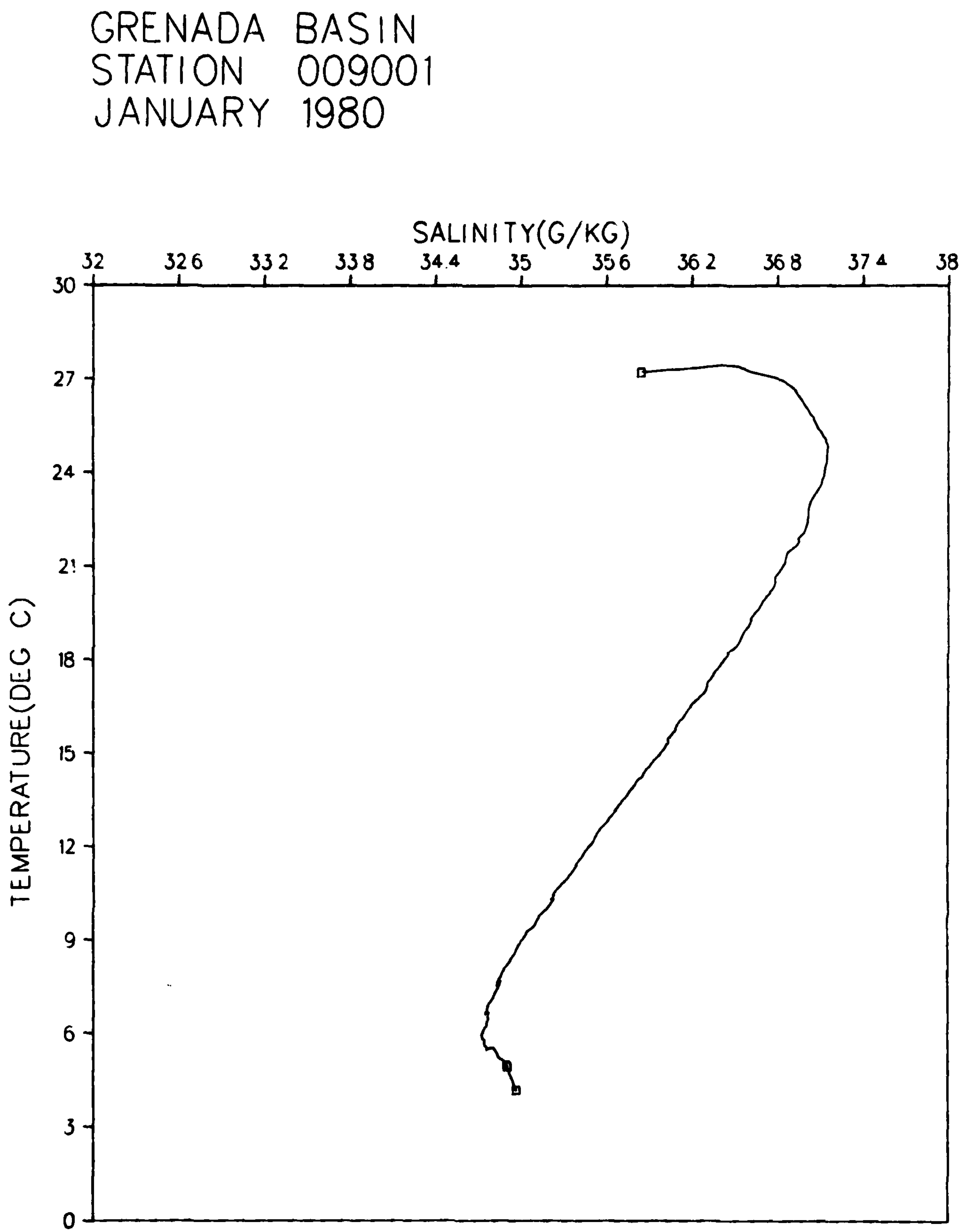

GRENADA BASIN
STATION 009001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 28.

STATION 010001
JANUARY 1980

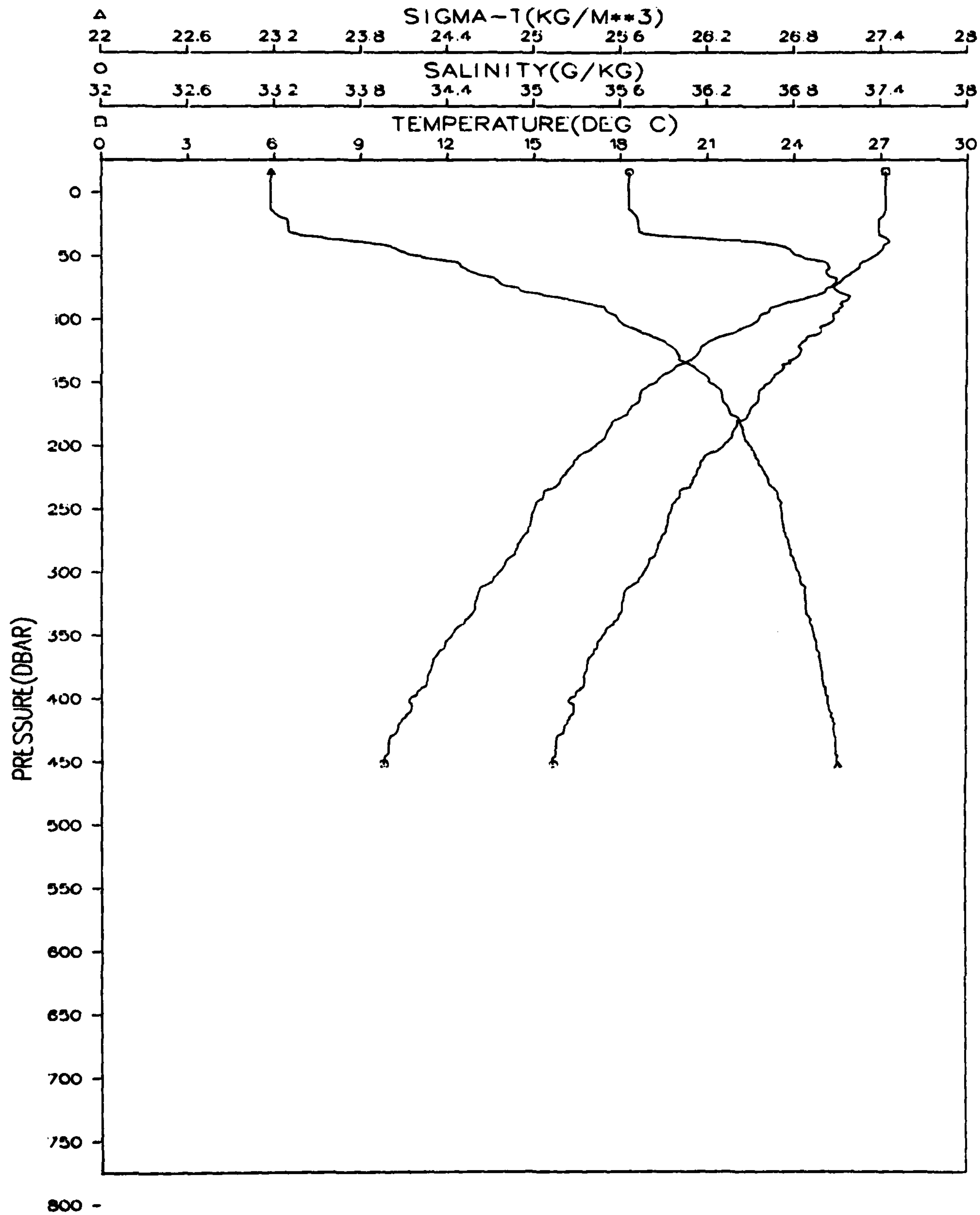


Figure 29.

GRENADA BASIN
STATION 010001
JANUARY 1980

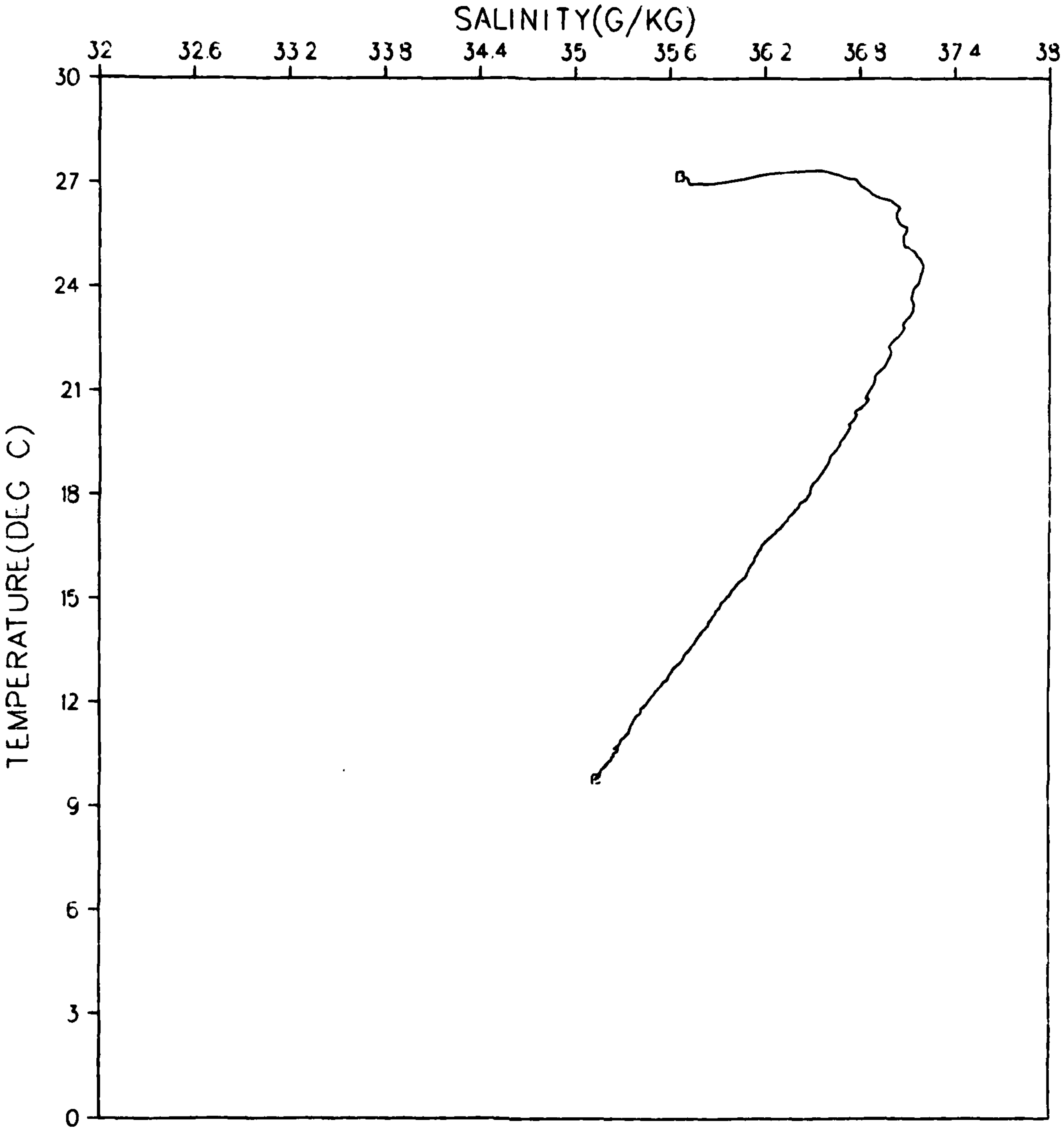


Figure 30.

GRENADA BASIN
STATION 011001
JANUARY 1980

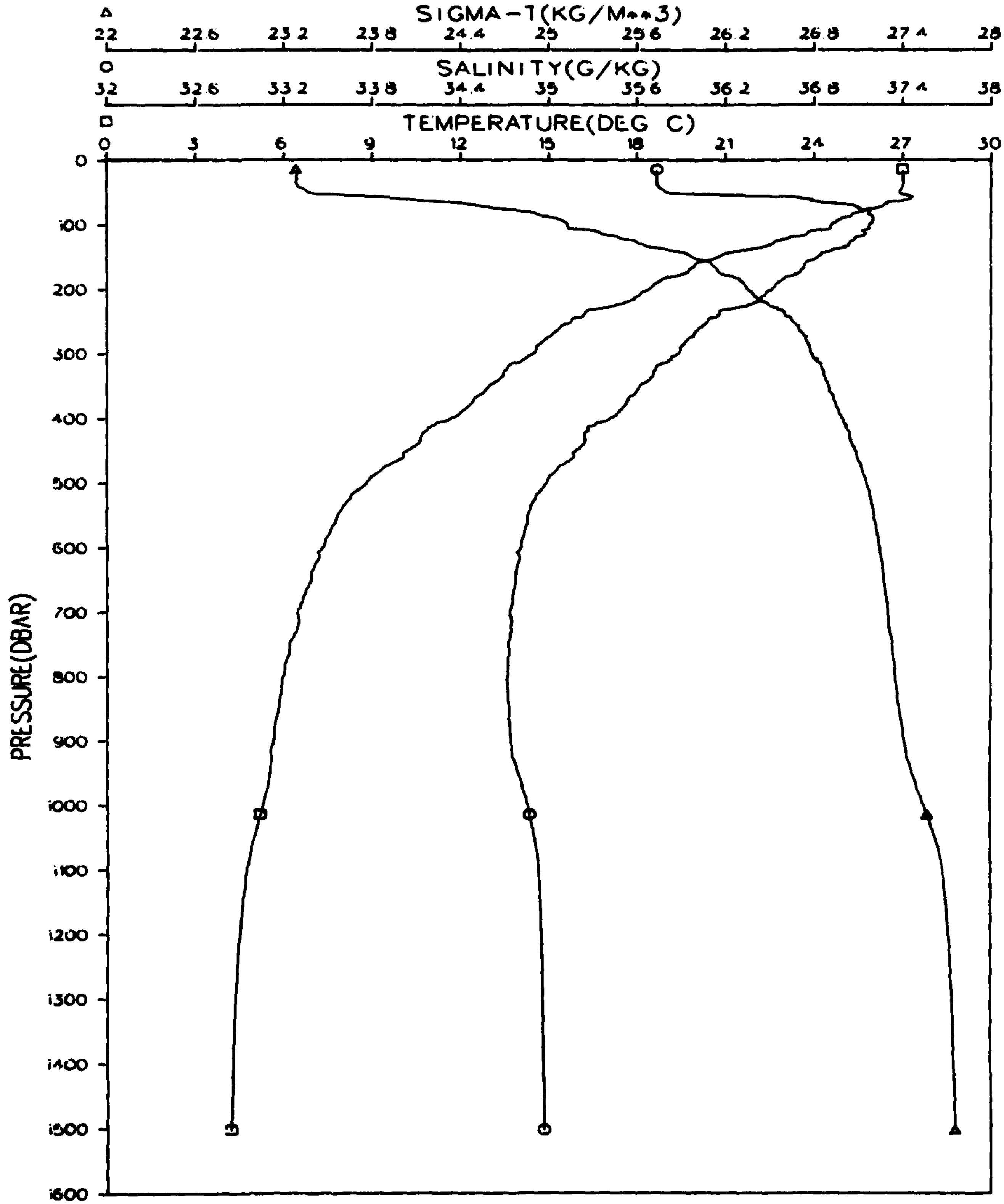


Figure 31.

GRENADA BASIN
STATION 011001
JANUARY 1980

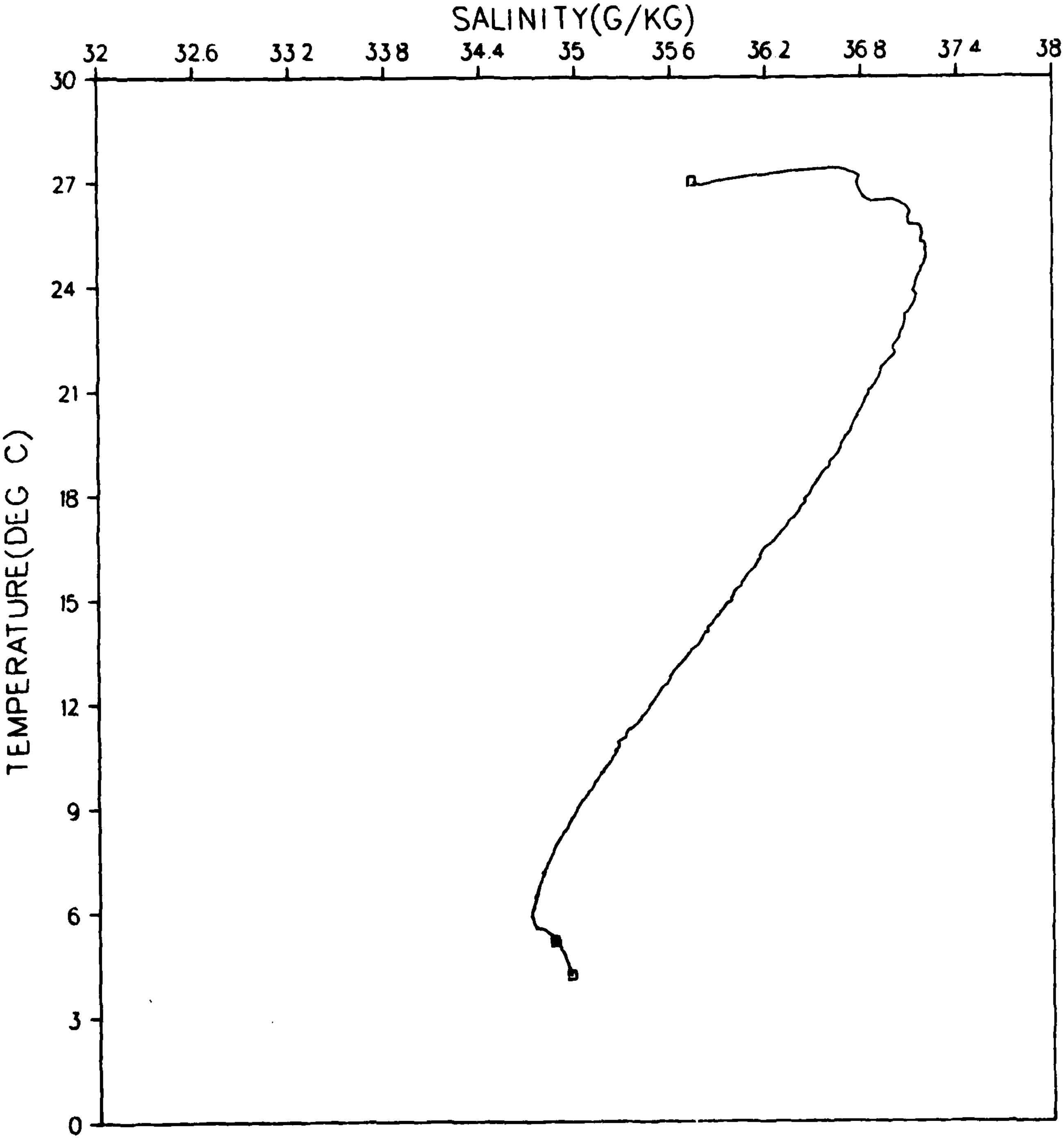


Figure 32.

GRENADA BASIN
STATION 012001
JANUARY 1980

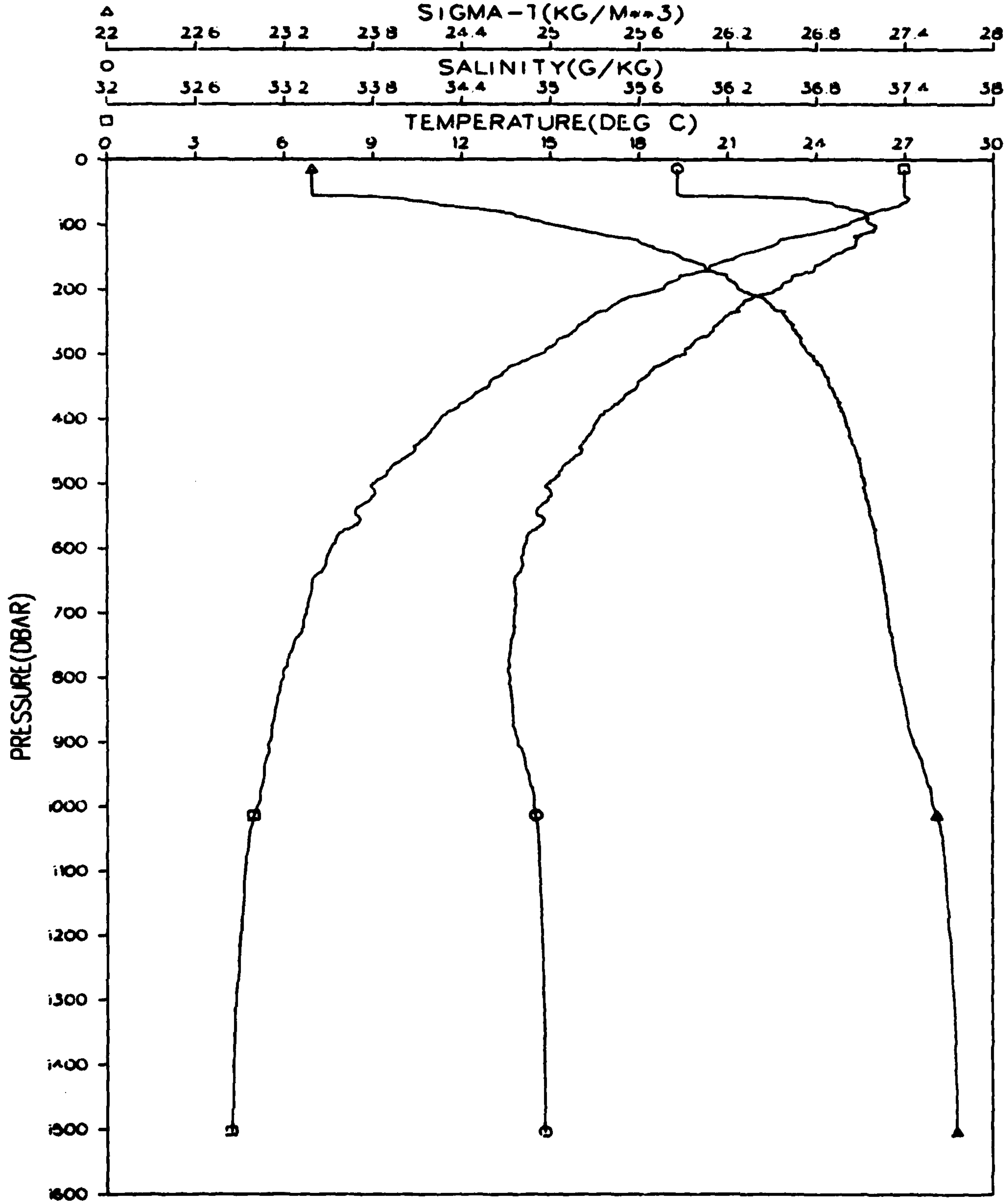


Figure 33.

GRENADA BASIN
STATION 012001
JANUARY 1980

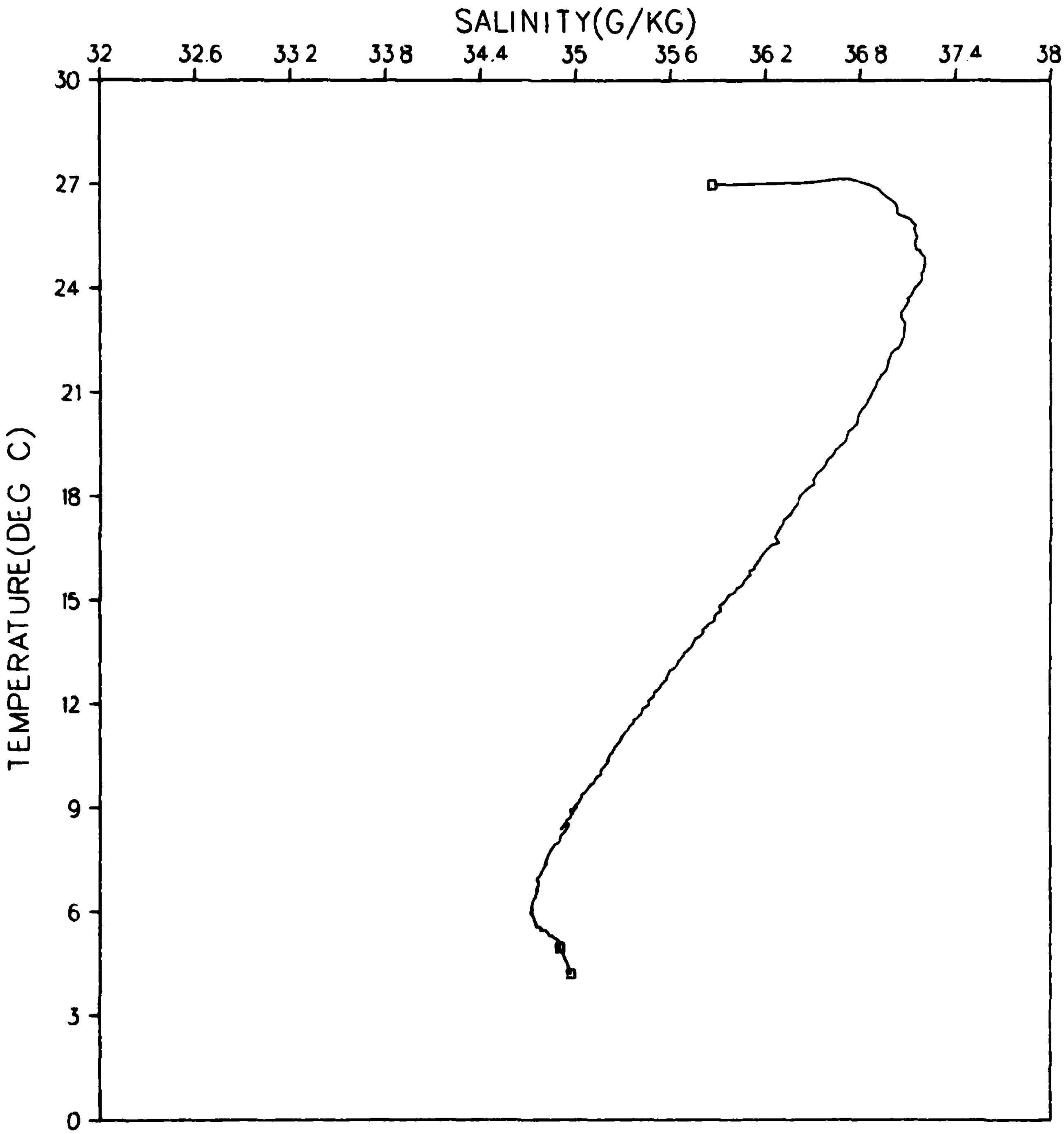


Figure 34.

GRENADA BASIN
STATION 013001
JANUARY 1980

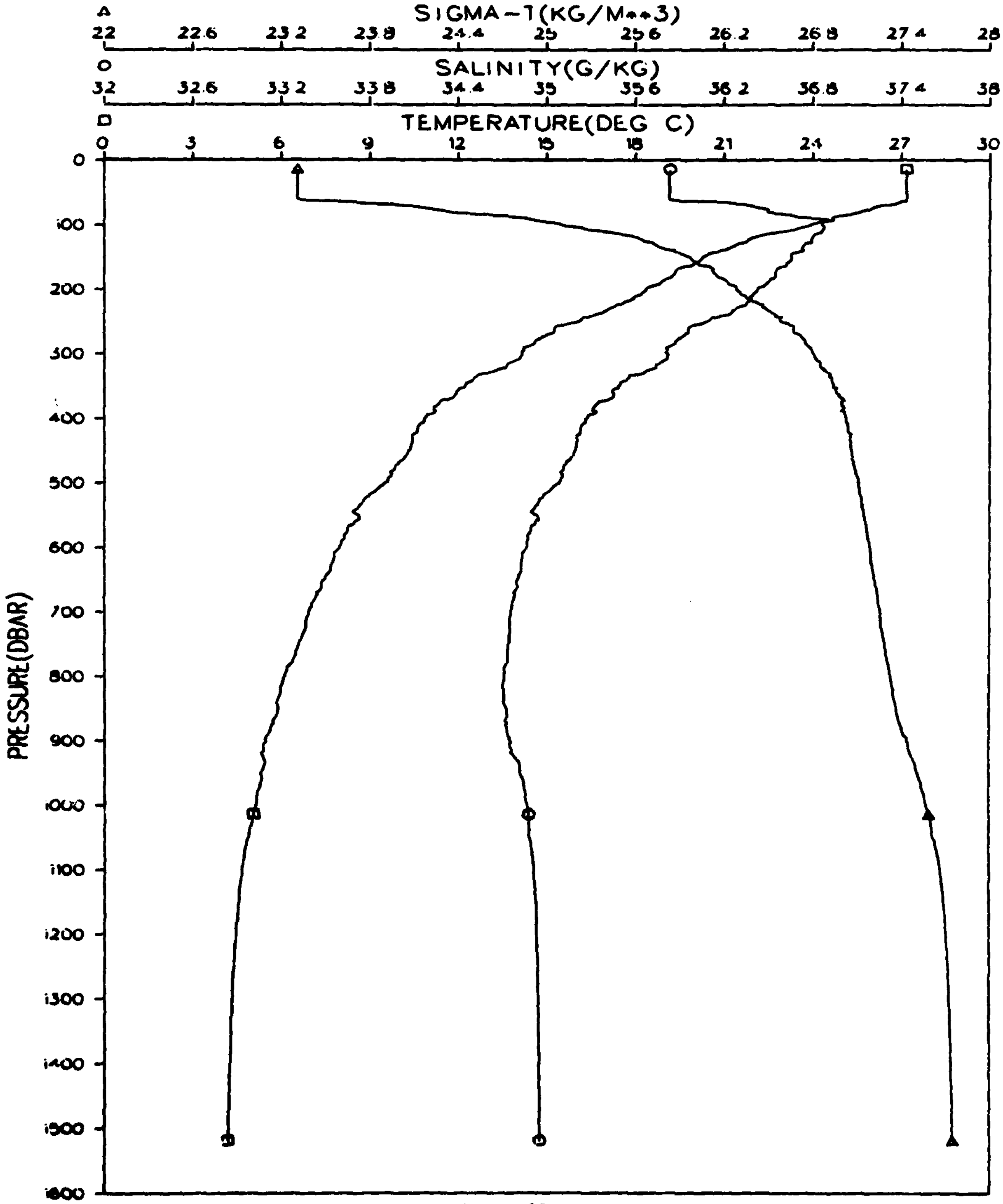


Figure 35.

GRENADA BASIN
STATION 013001
JANUARY 1980

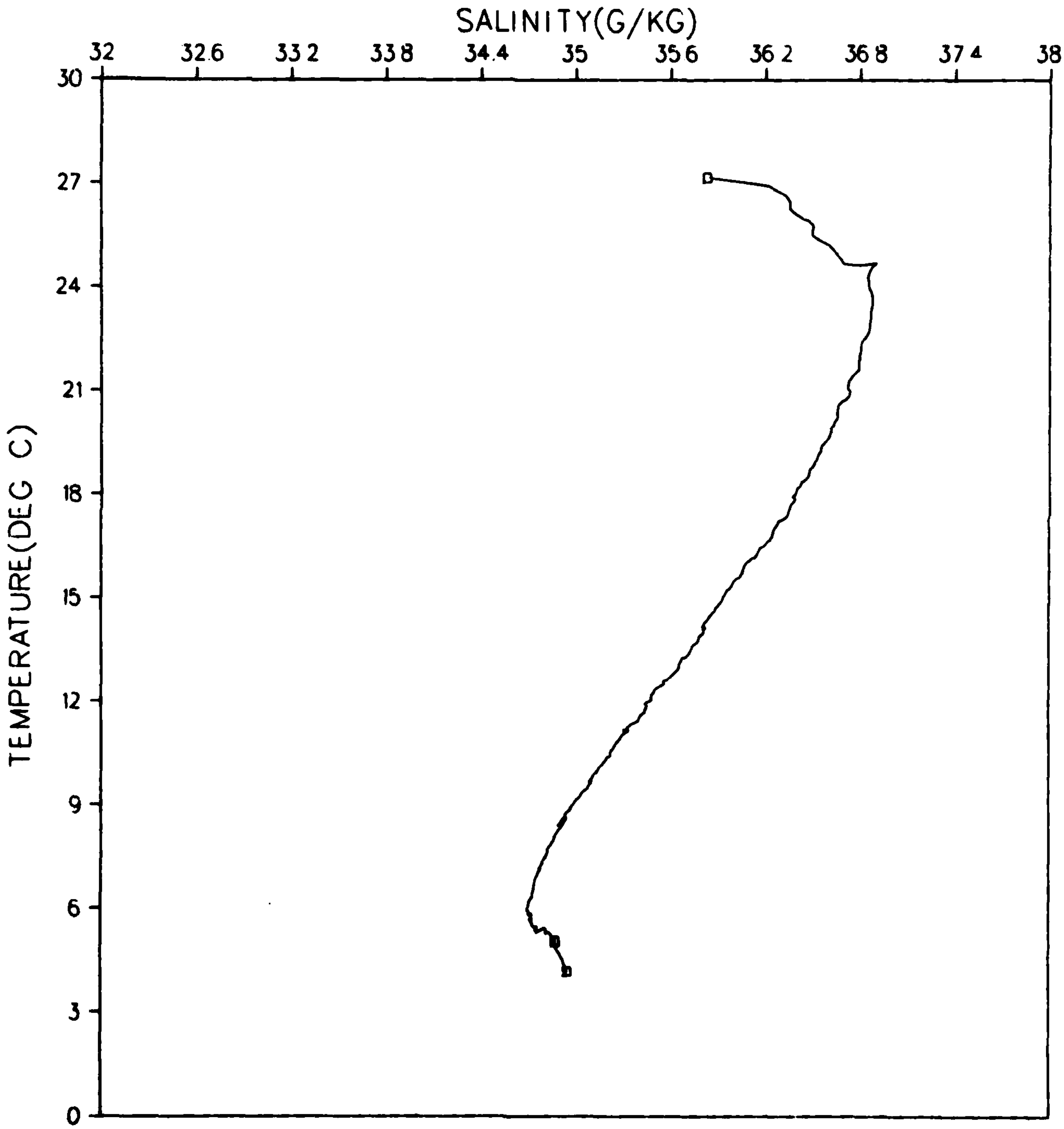


Figure 36.

GRENADA BASIN
STATION 014001
JANUARY 1980

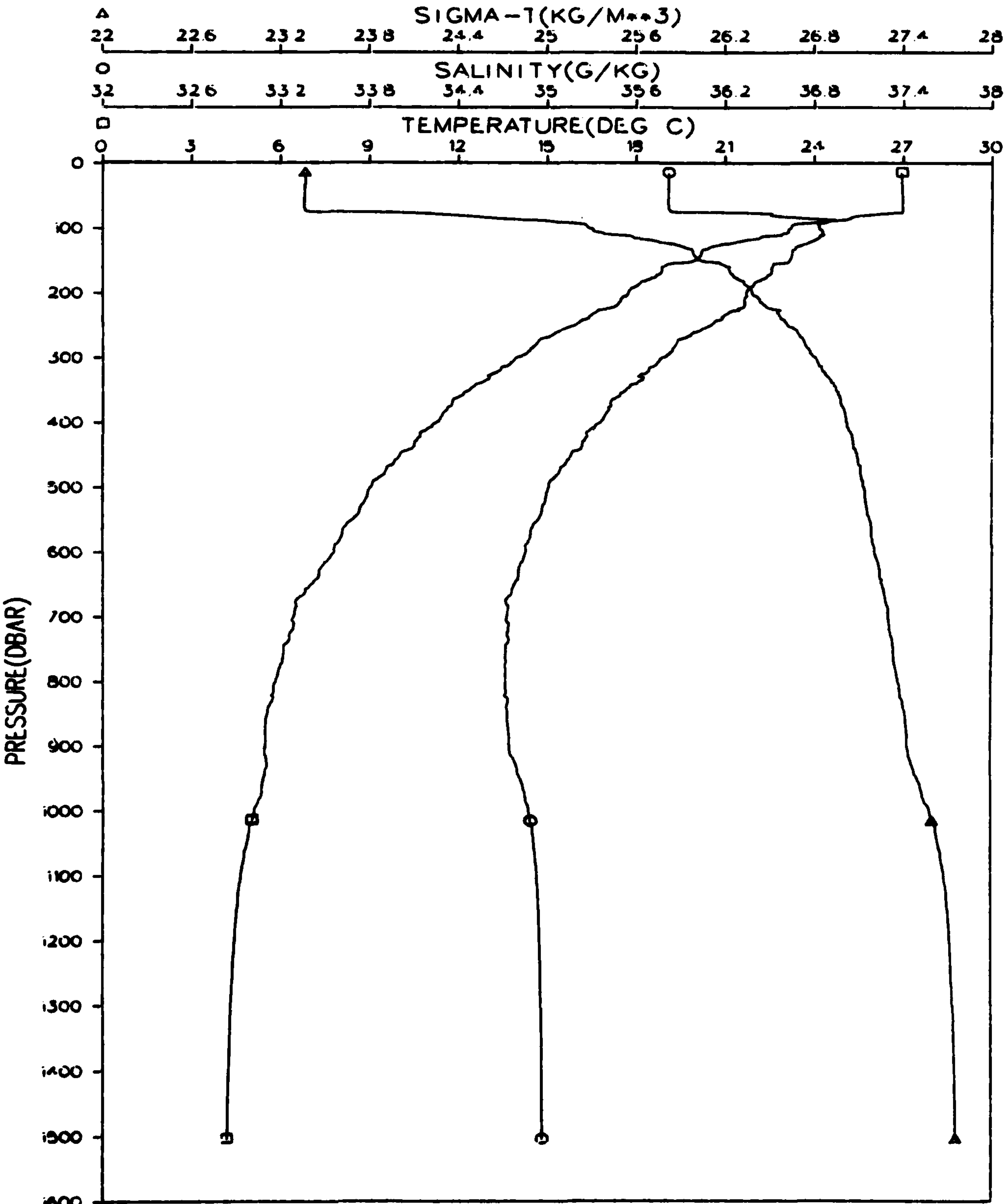


Figure 37.

GRENADA BASIN
STATION 014001
JANUARY 1980

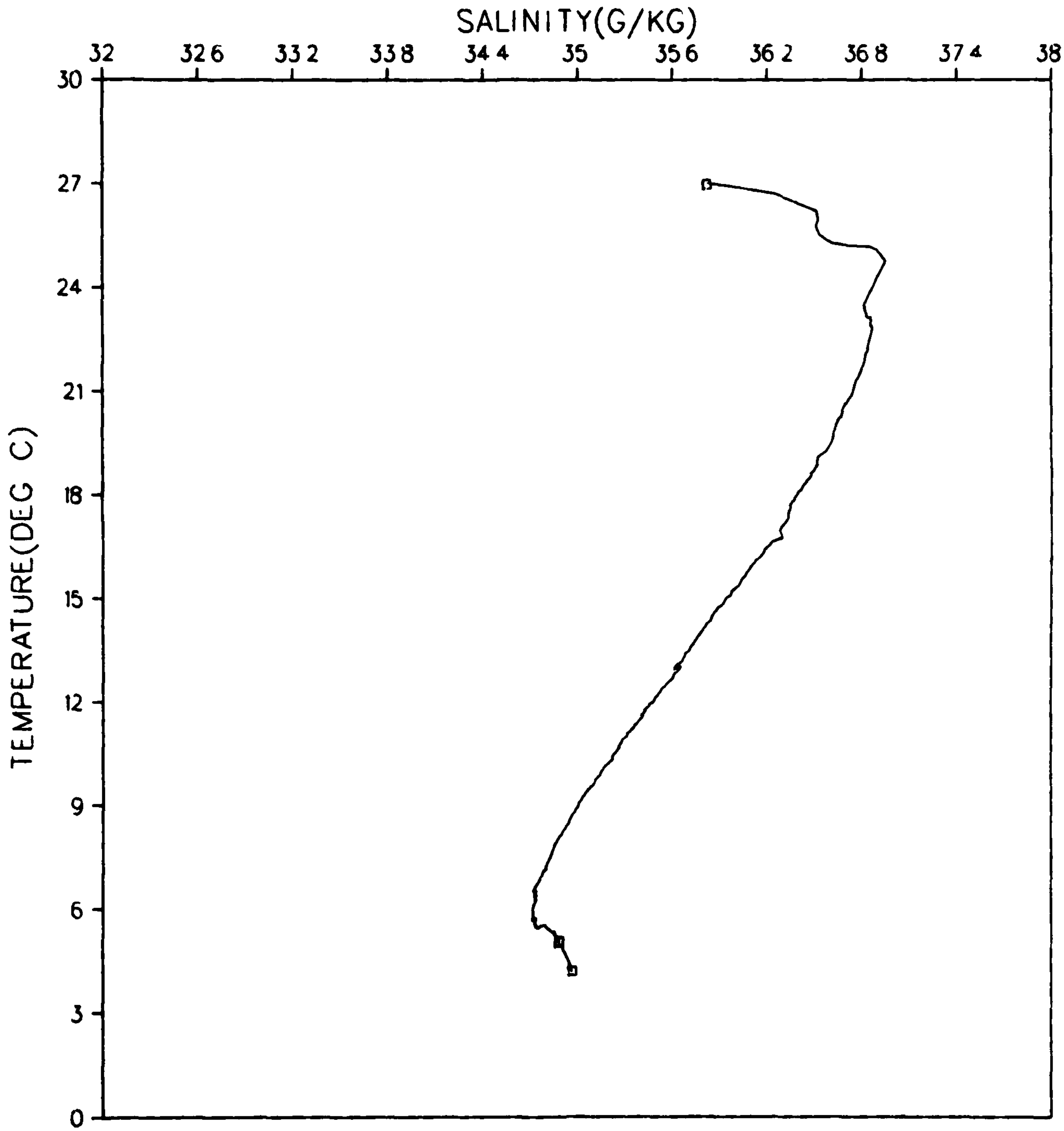


Figure 38.

GRENADA BASIN
STATION 015001
JANUARY 1980

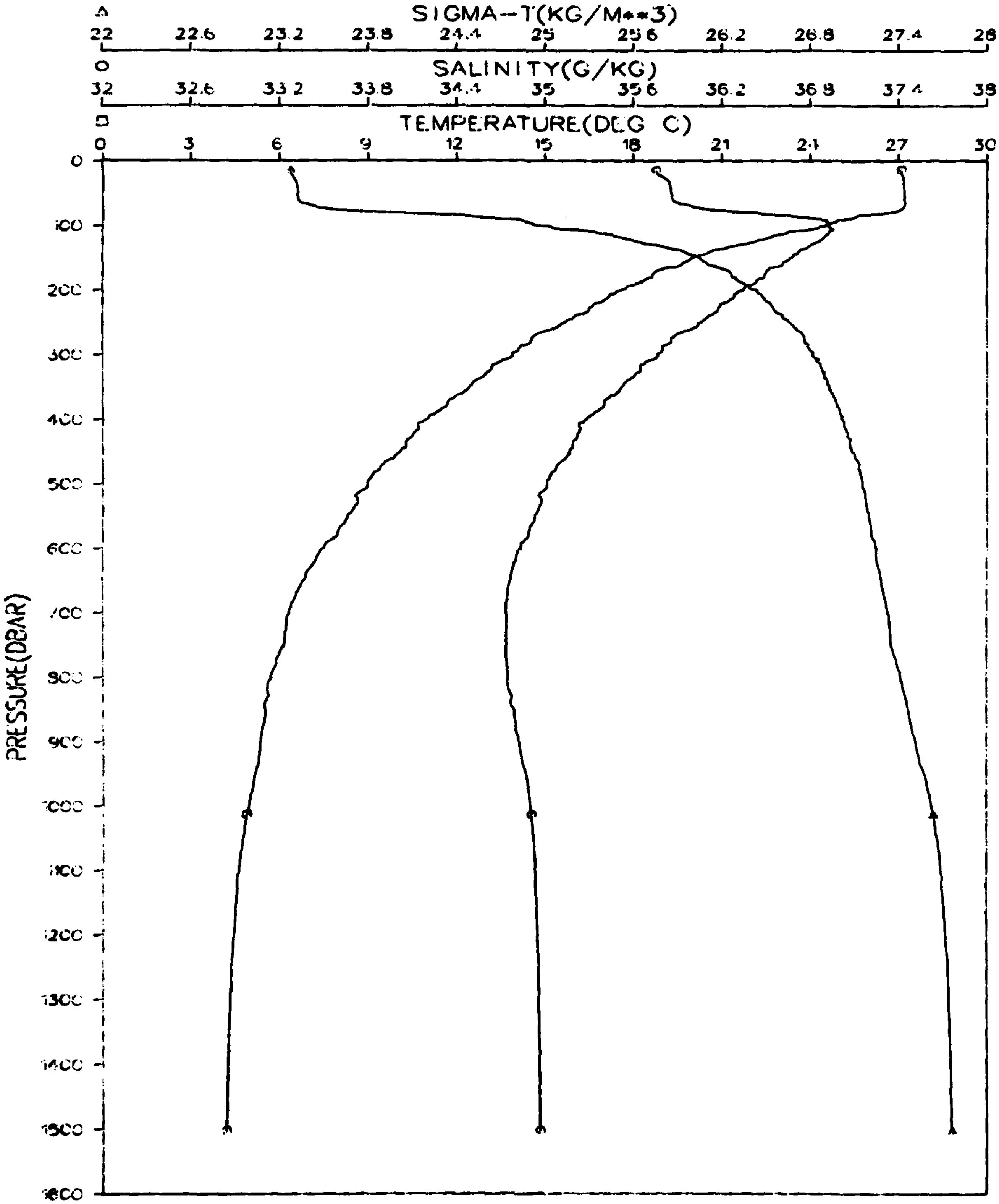


Figure 39.

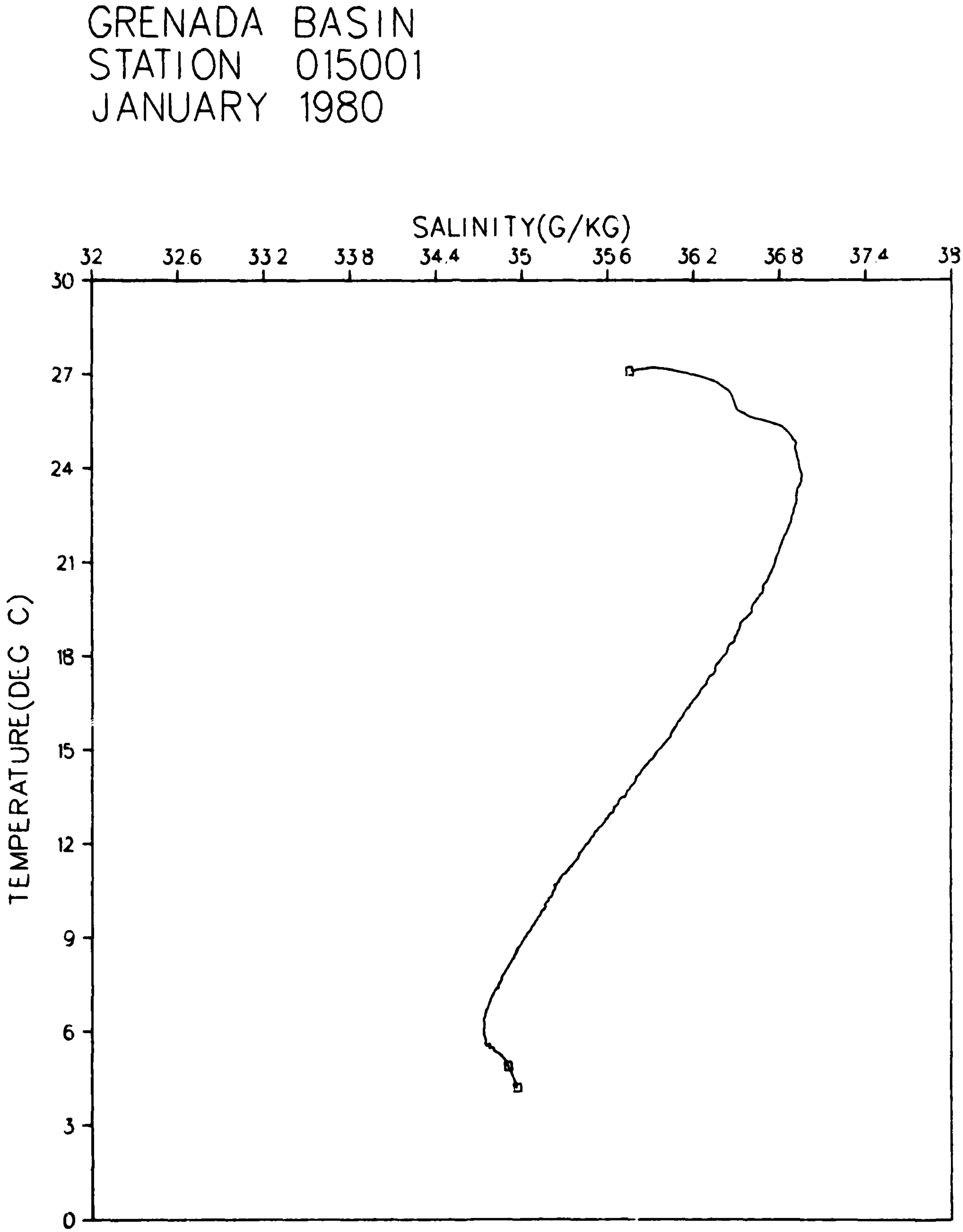

GRENADA BASIN
STATION 015001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 40.

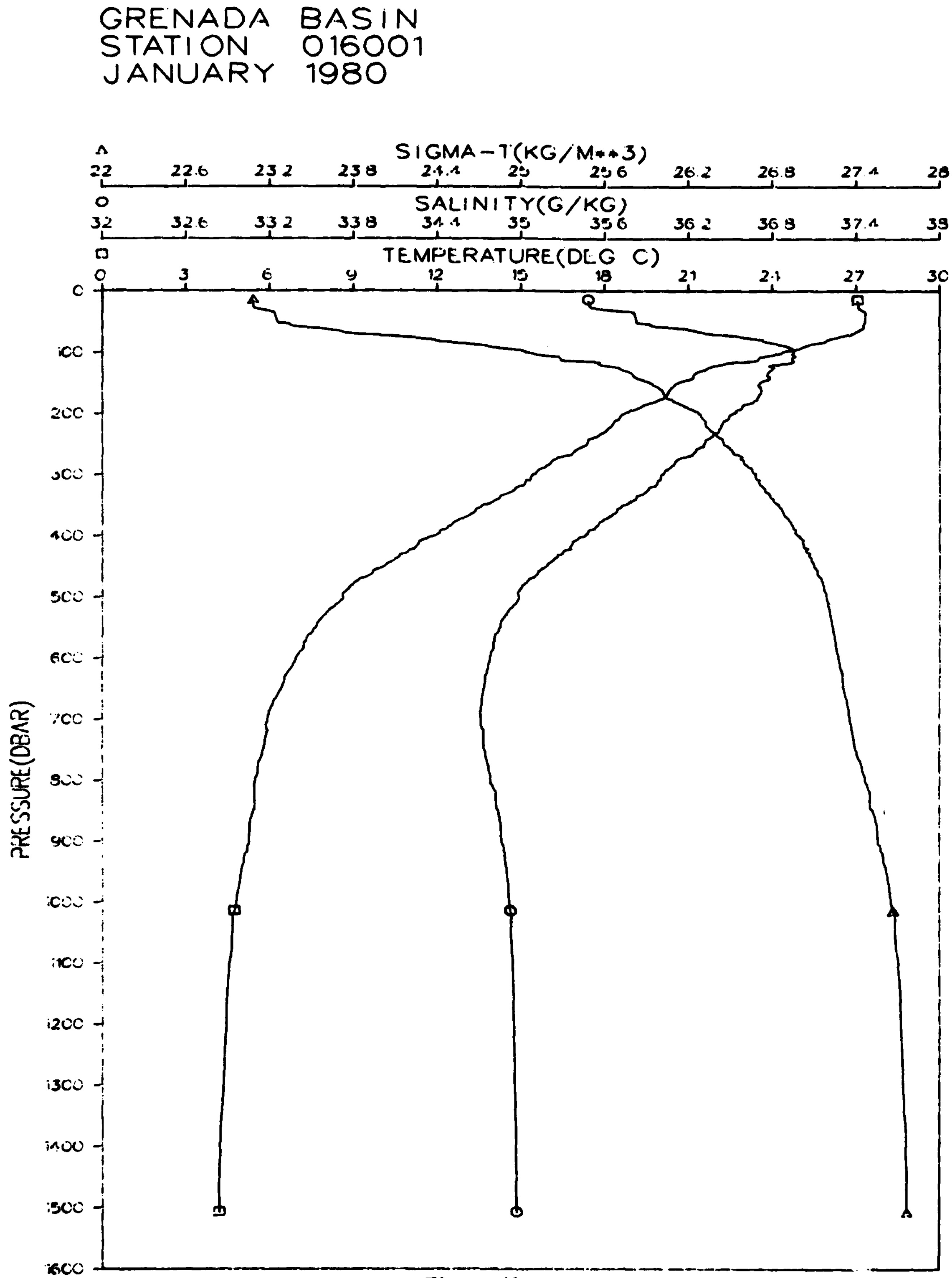

GRENADA BASIN
STATION 016001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 41.

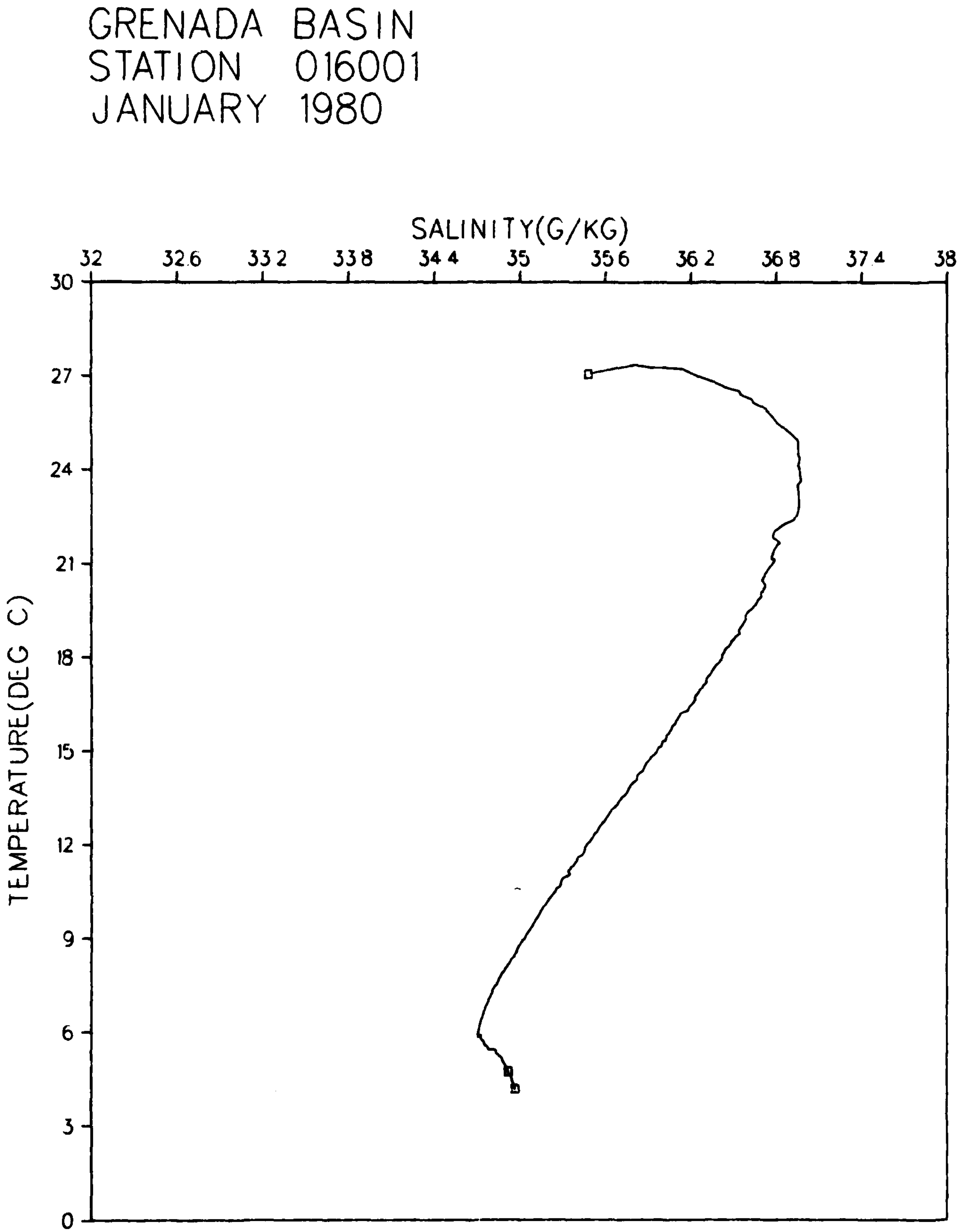

GRENADA BASIN
STATION 016001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 42.

GRENADA BASIN
STATION 017001
JANUARY 1980

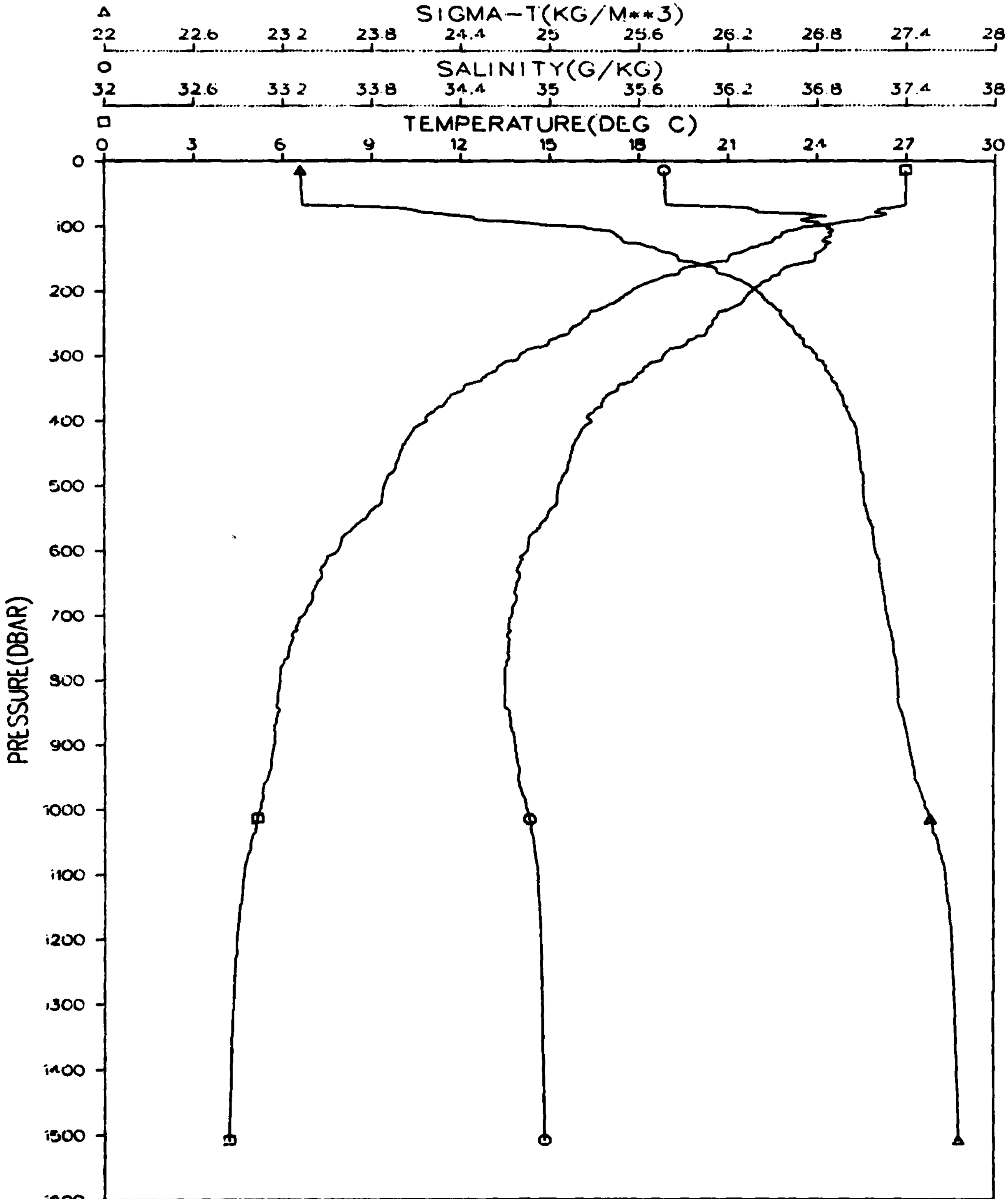


Figure 43.

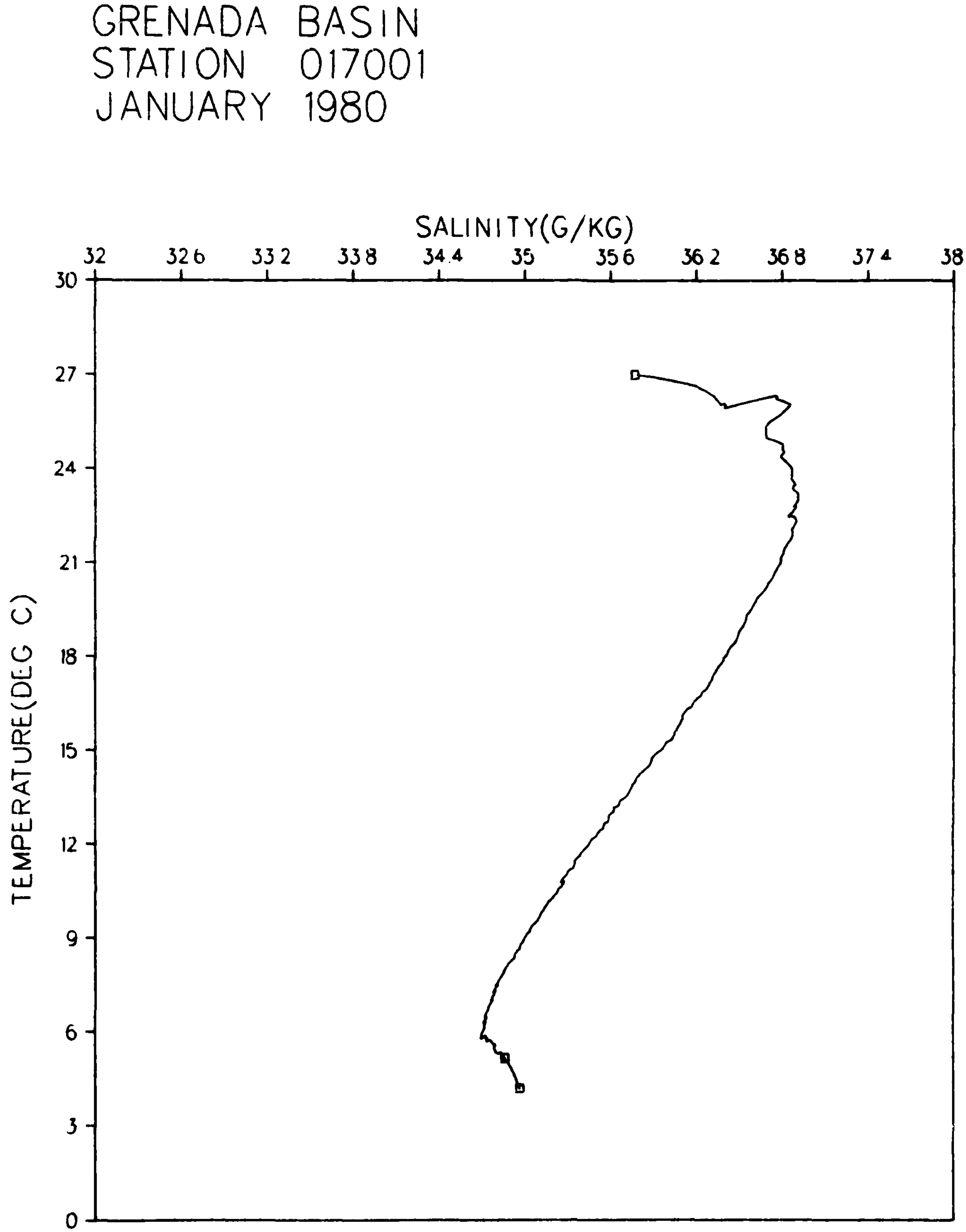

GRENADA BASIN
STATION 017001
JANUARY 1980
SALINITY(G/KG)
32
326
332
338
34.4
35
356
362
368
374
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 44.

GRENADA BASIN
STATION 018001
JANUARY 1980

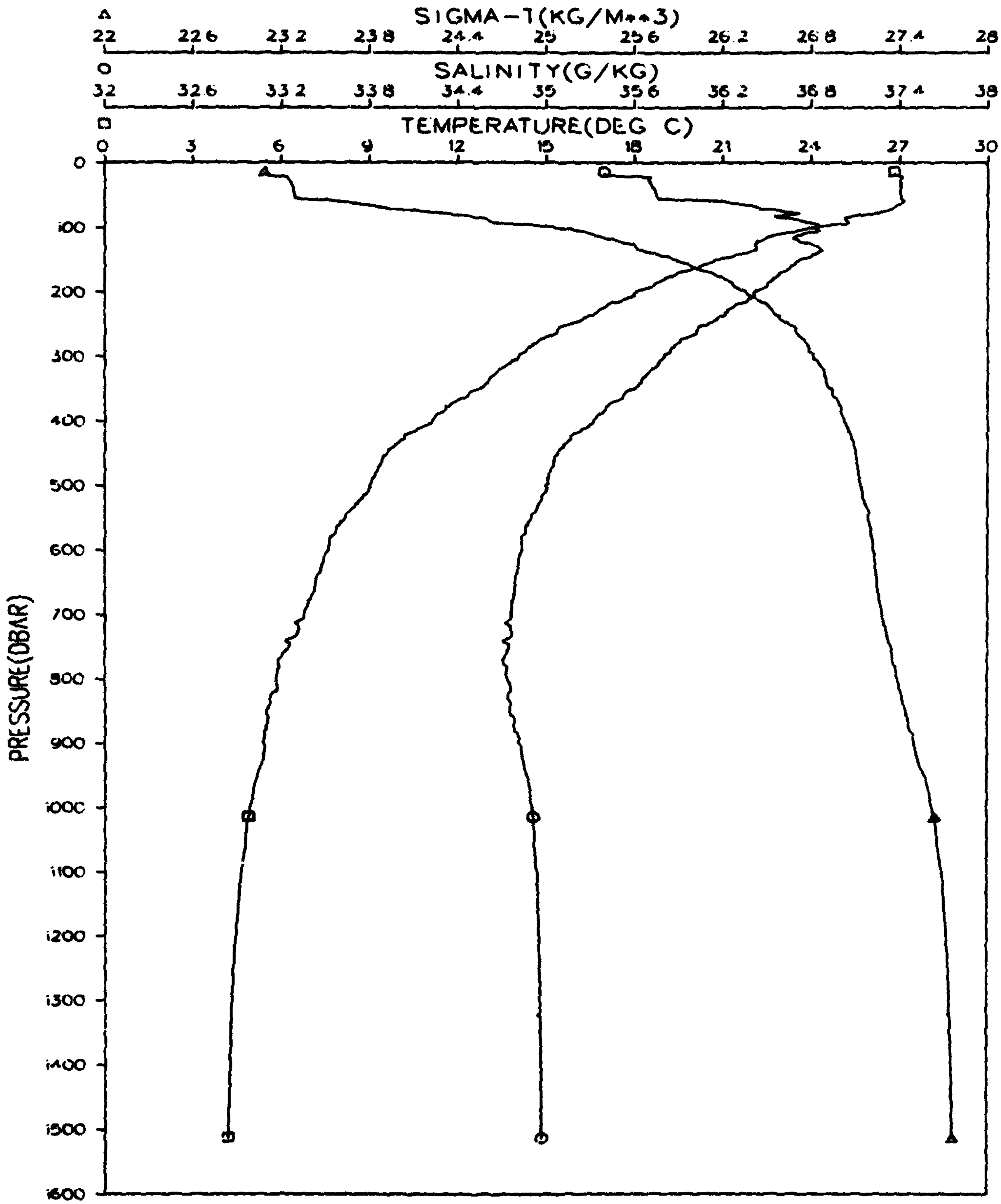


Figure 45.

GRENADA BASIN
STATION 018001
JANUARY 1980

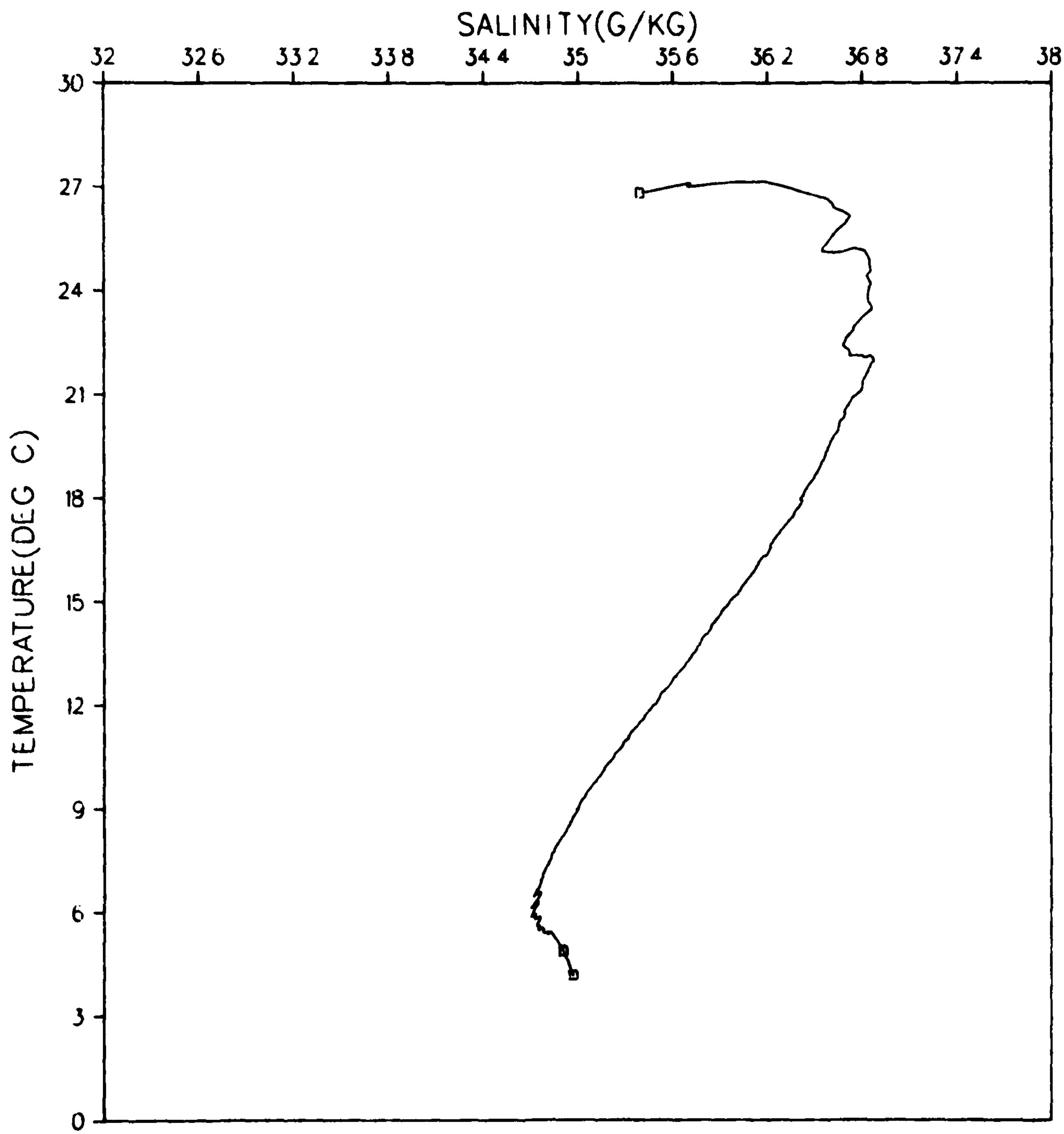


Figure 46.

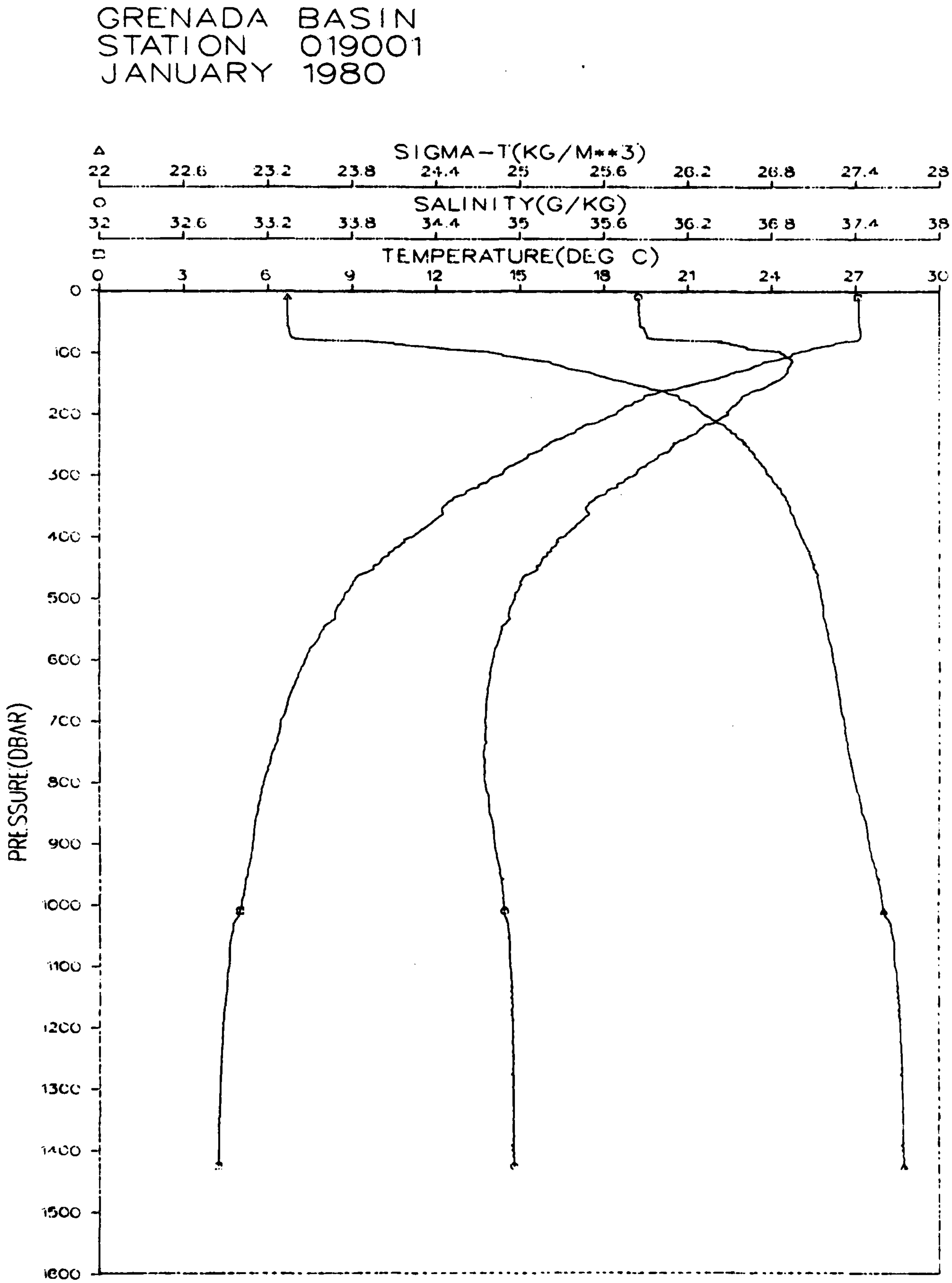

GRENADA BASIN
STATION 019001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 47.

GRENADA BASIN CARIBBEAN SEA
STATION 019001
JANUARY 1980

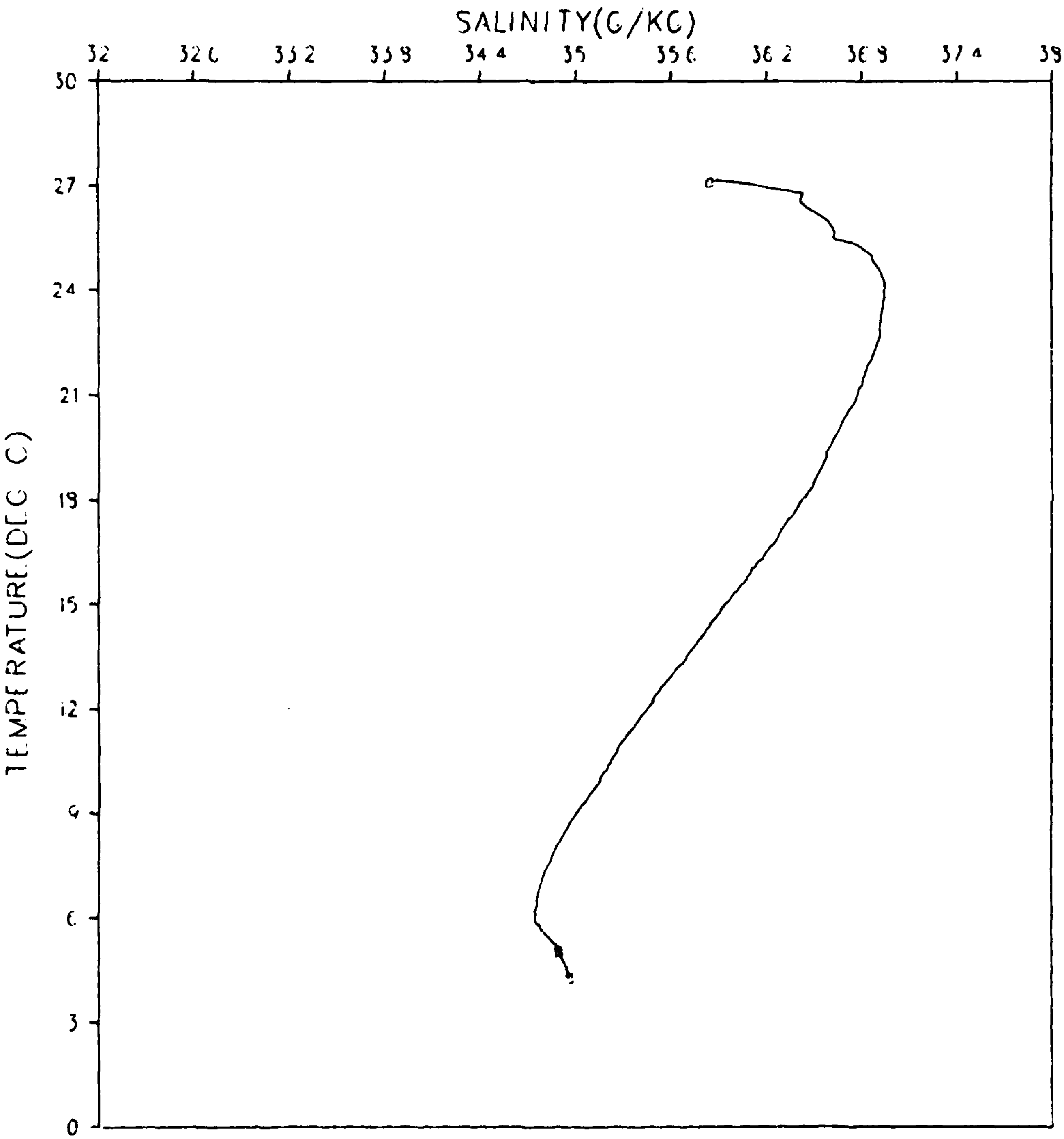


Figure 48.

GRENADA BASIN
STATION 020001
JANUARY 1980

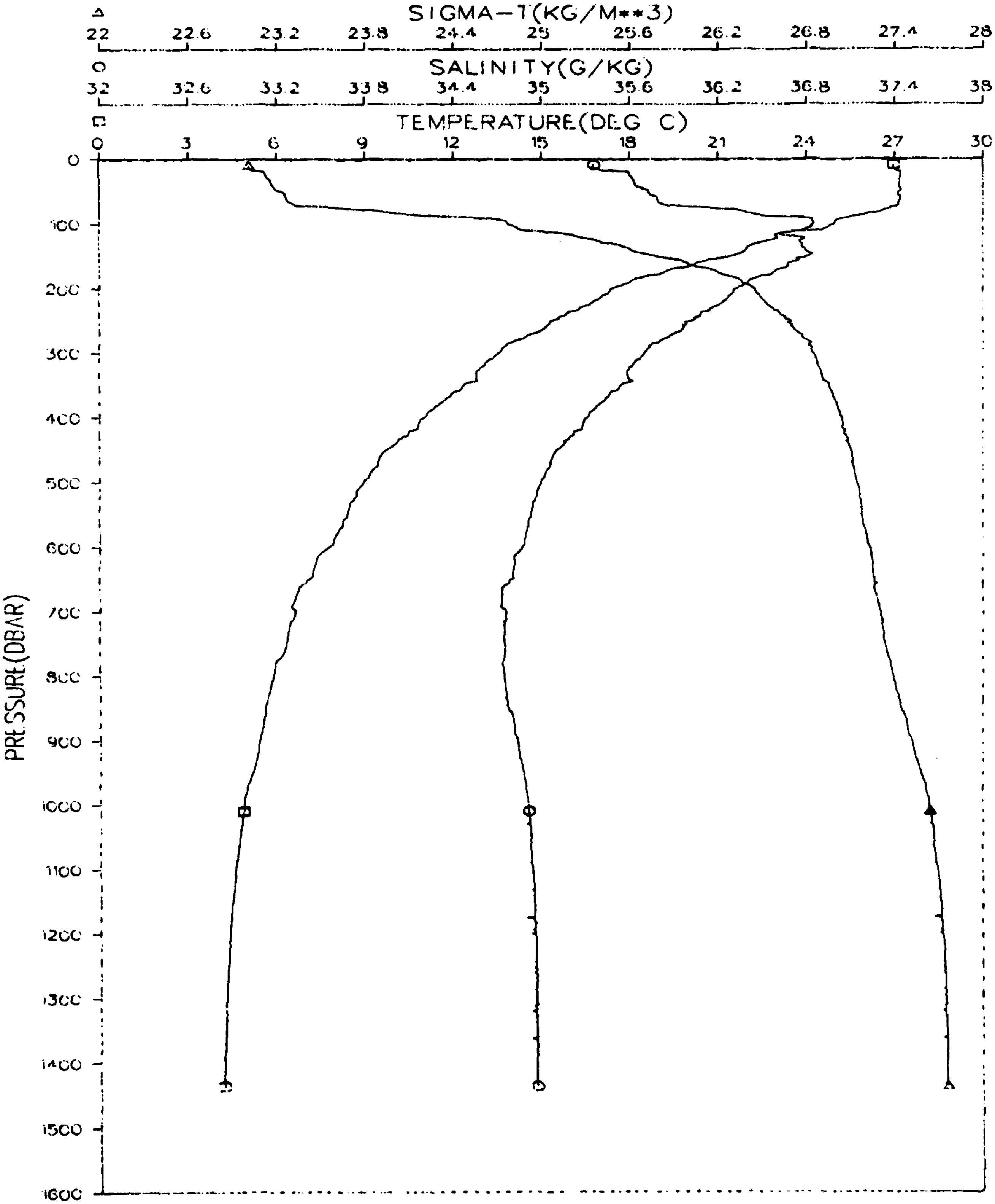


Figure 49.

GRENADA BASIN
STATION 020001
JANUARY 1980

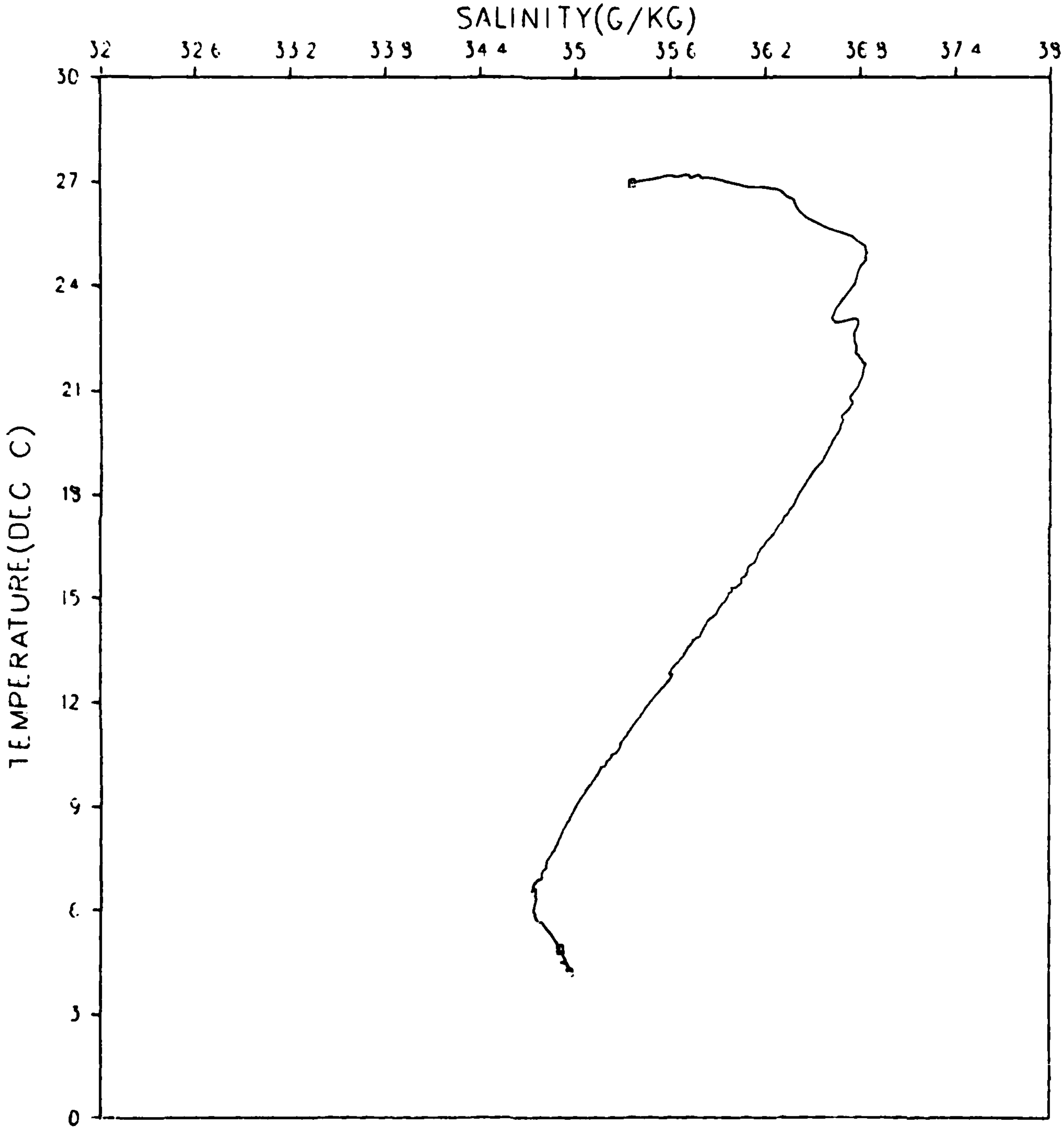
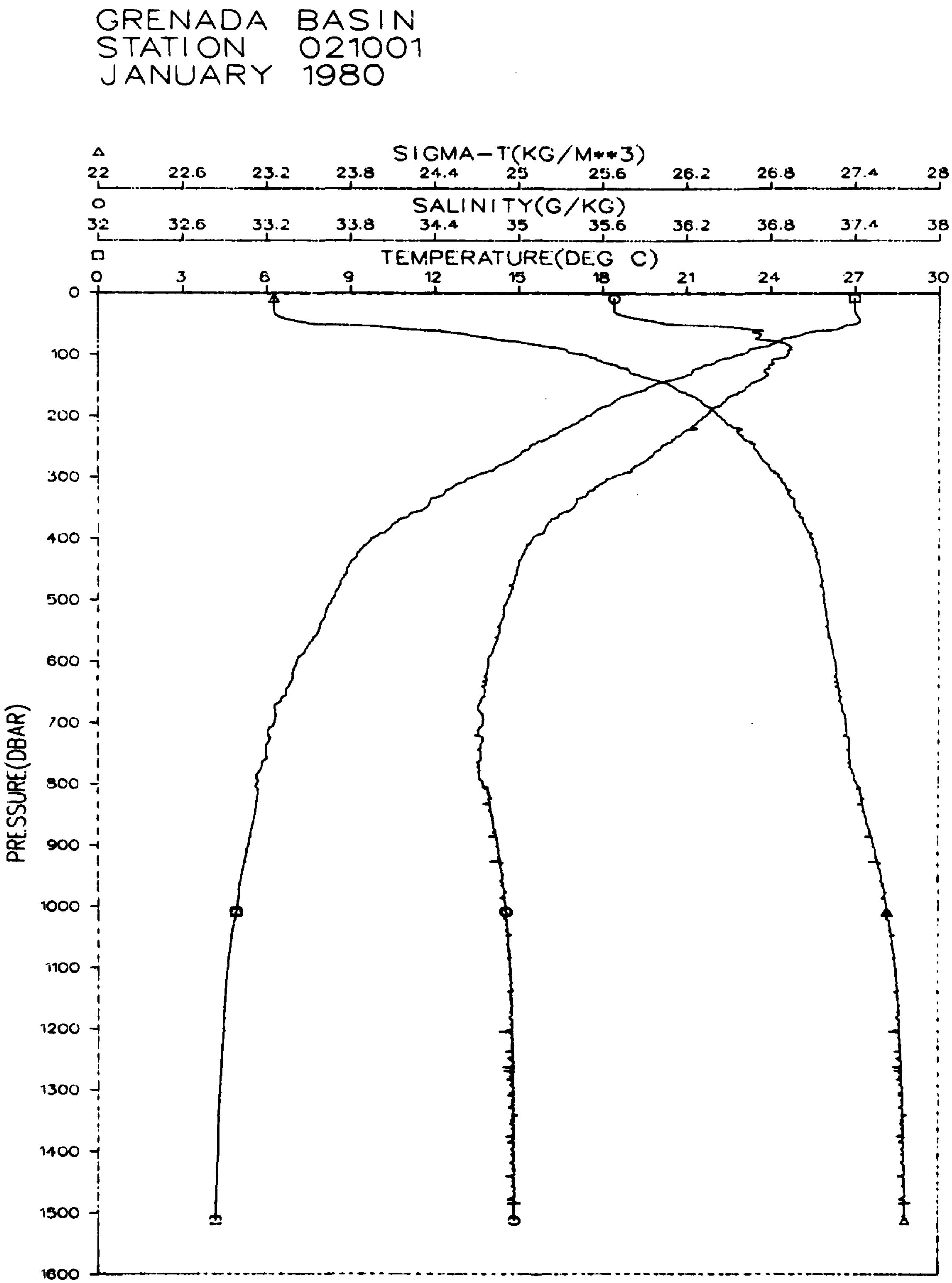


Figure 50.



GRENADA BASIN
STATION 021001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 51.

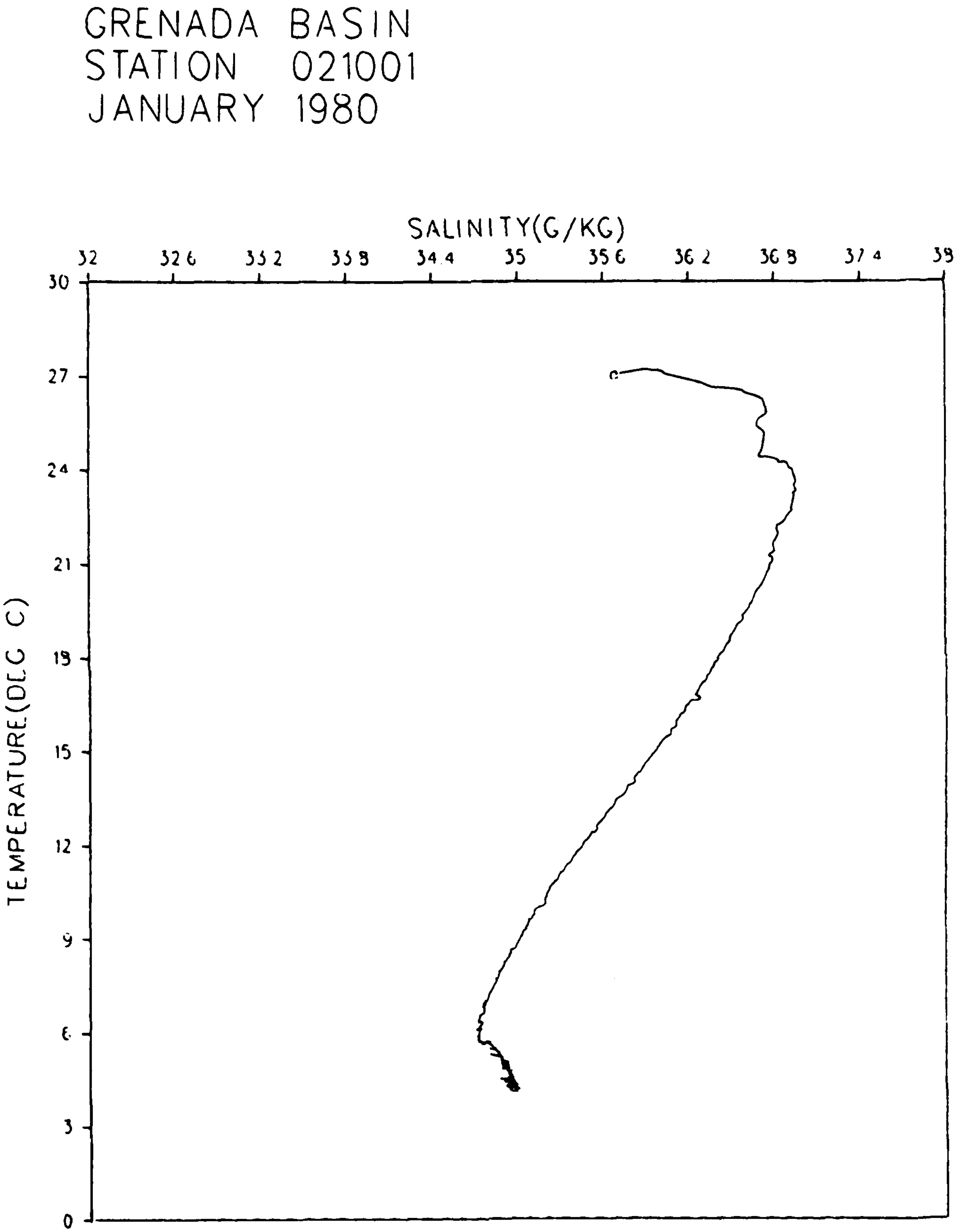

GRENADA BASIN
STATION 021001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 52.

GRENADA BASIN
STATION 022001
JANUARY 1980

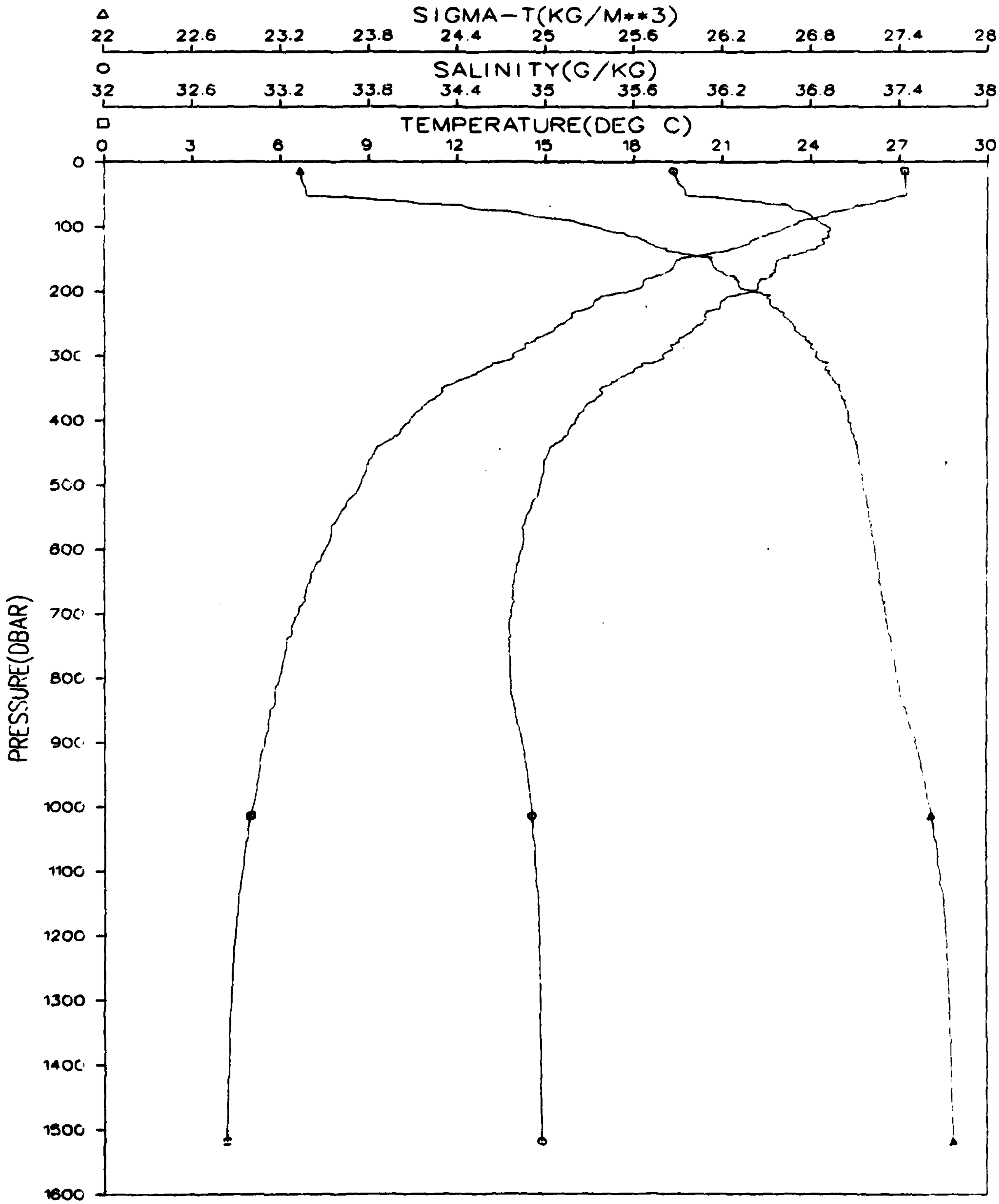


Figure 53.

GRENADA BASIN
STATION 022001
JANUARY 1980

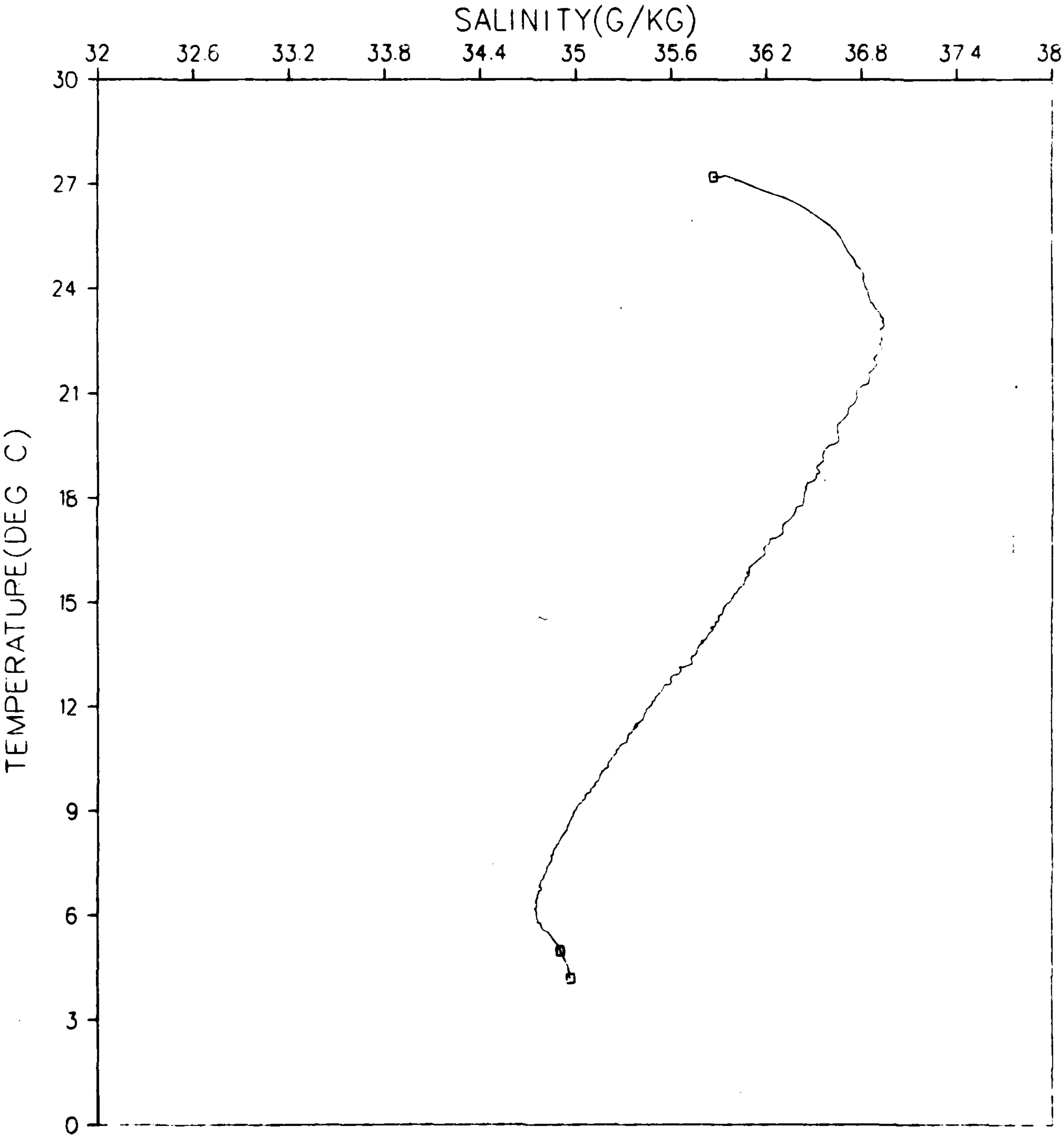


Figure 54.

GRENADA BASIN
STATION 024001
JANUARY 1980

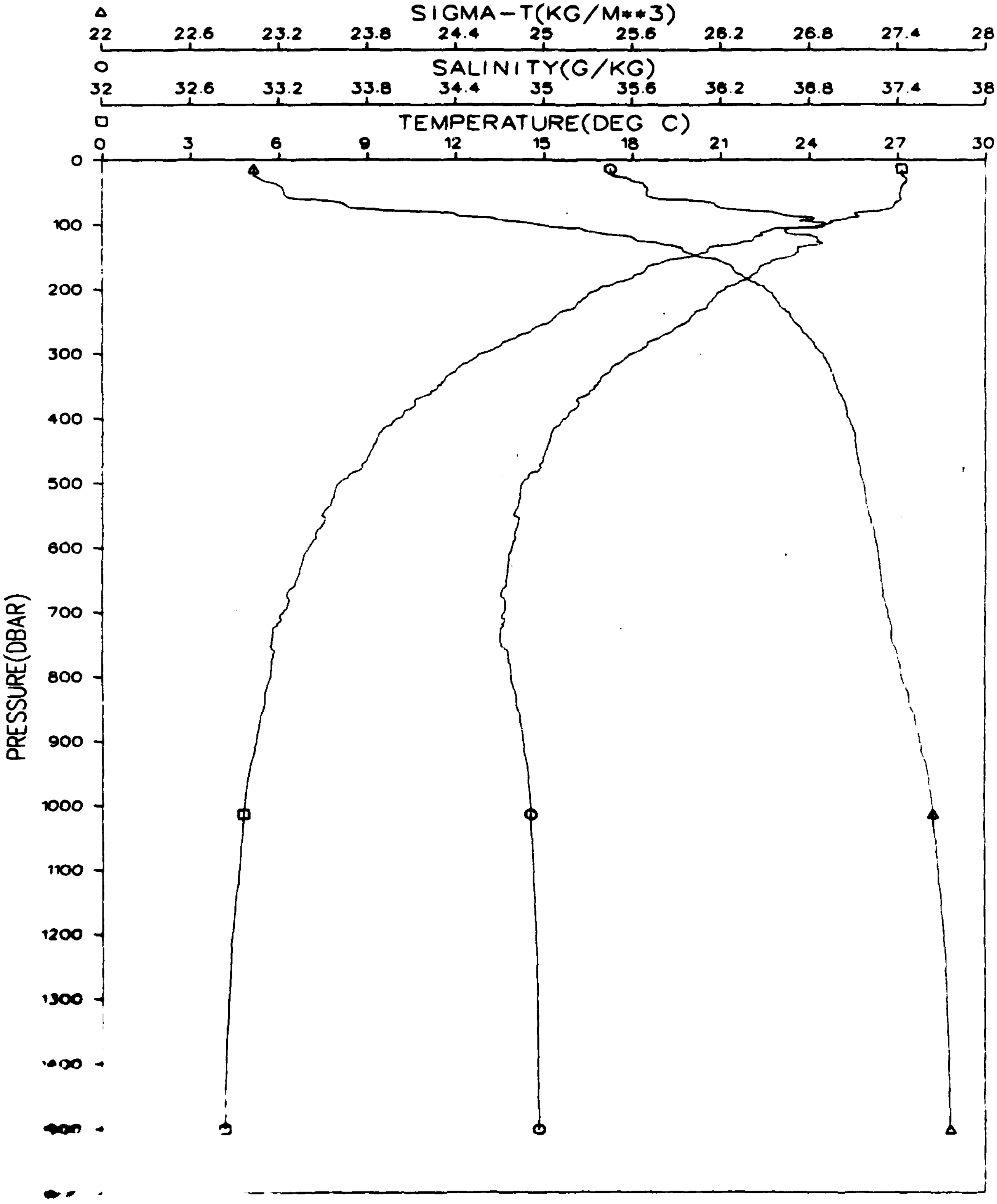


Figure 55.

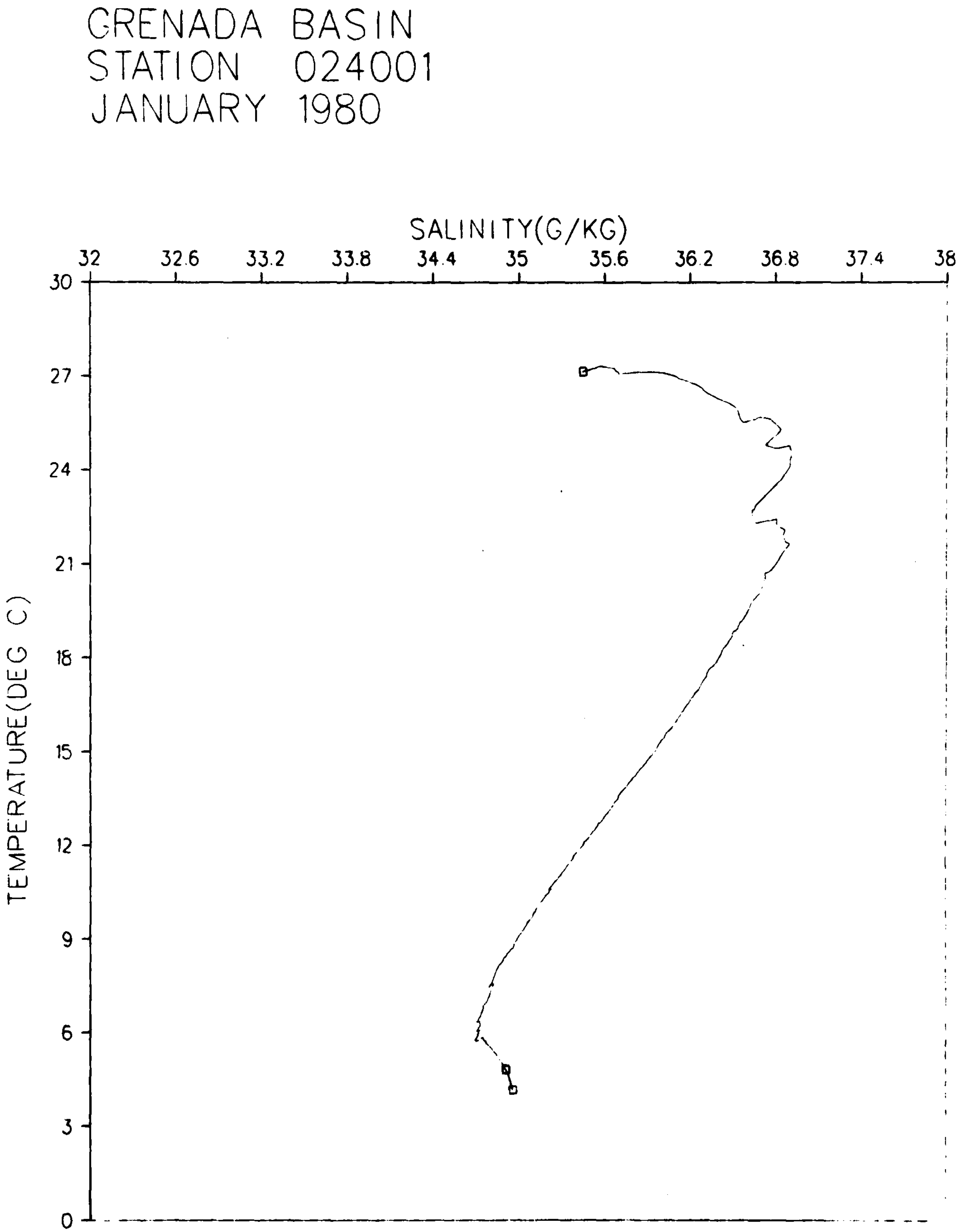

GRENADA BASIN
STATION 024001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
30
27
24
21
18
15
12
9
6
3
0
TEMPERATURE(DEG C)

Figure 56.

GRENADA BASIN
STATION 025001
JANUARY 1980

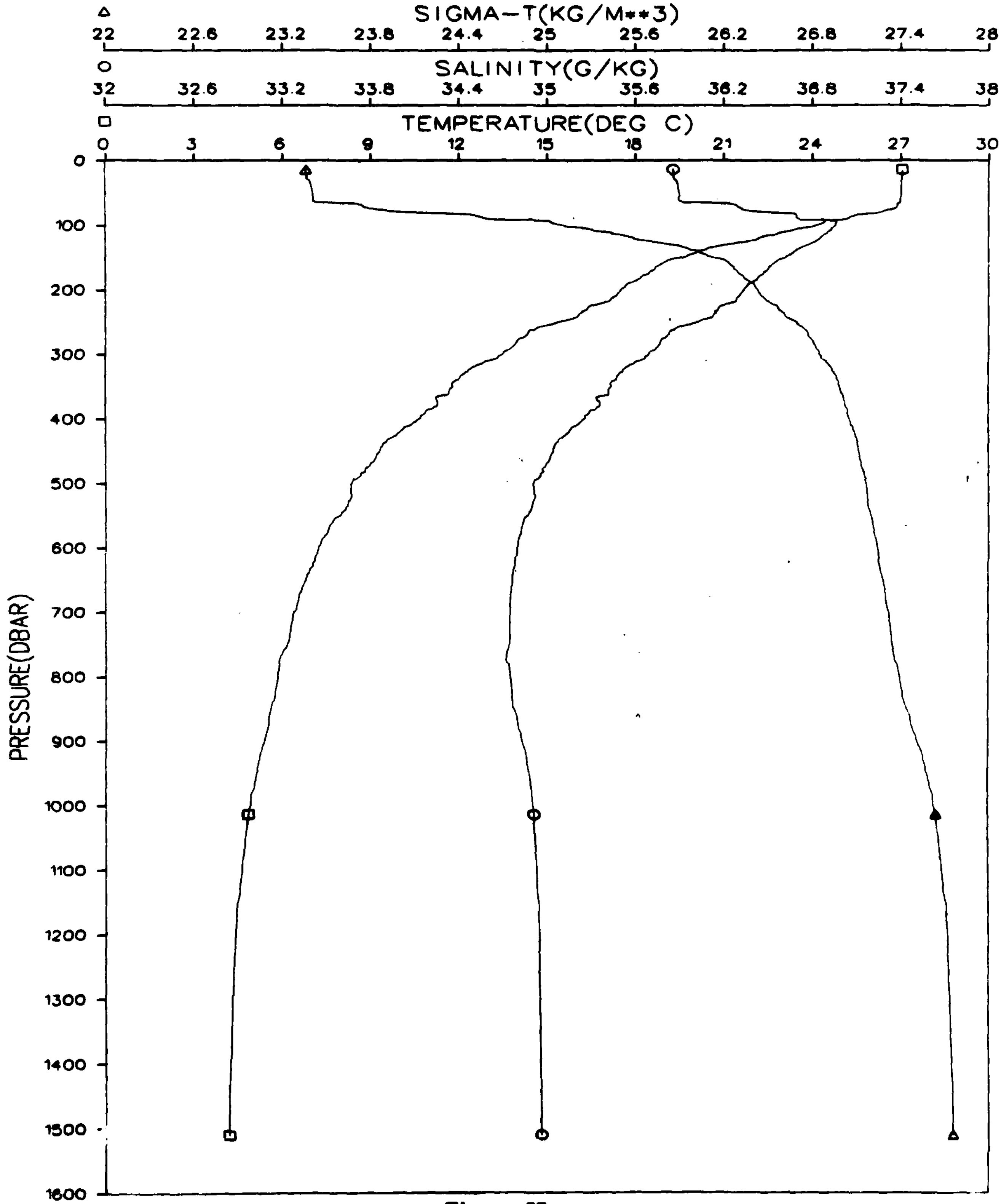


Figure 57.

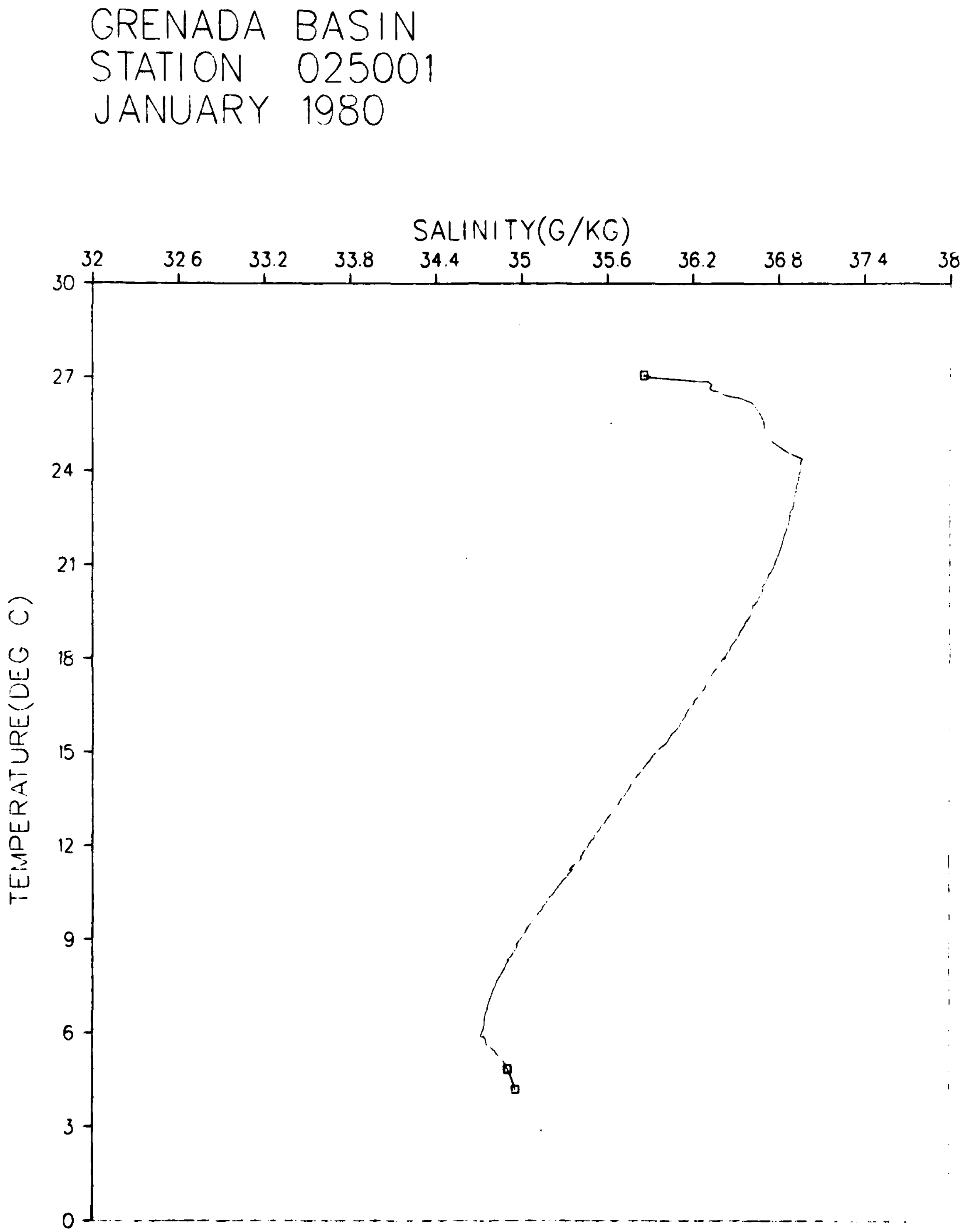
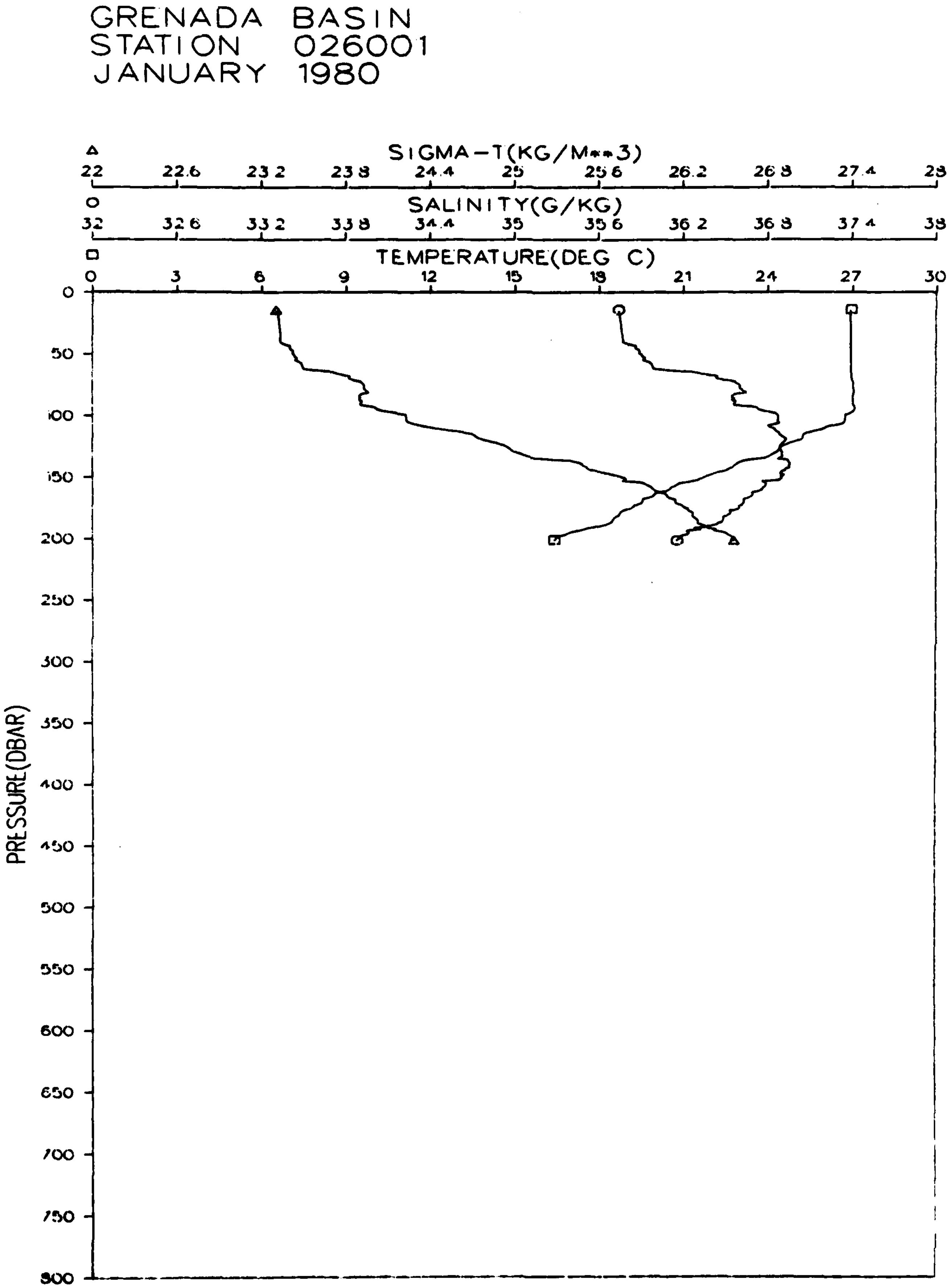

GRENADA BASIN
STATION 025001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 58.



GRENADA BASIN
STATION 026001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800

Figure 59.

GRENADA BASIN
STATION 026001
JANUARY 1980

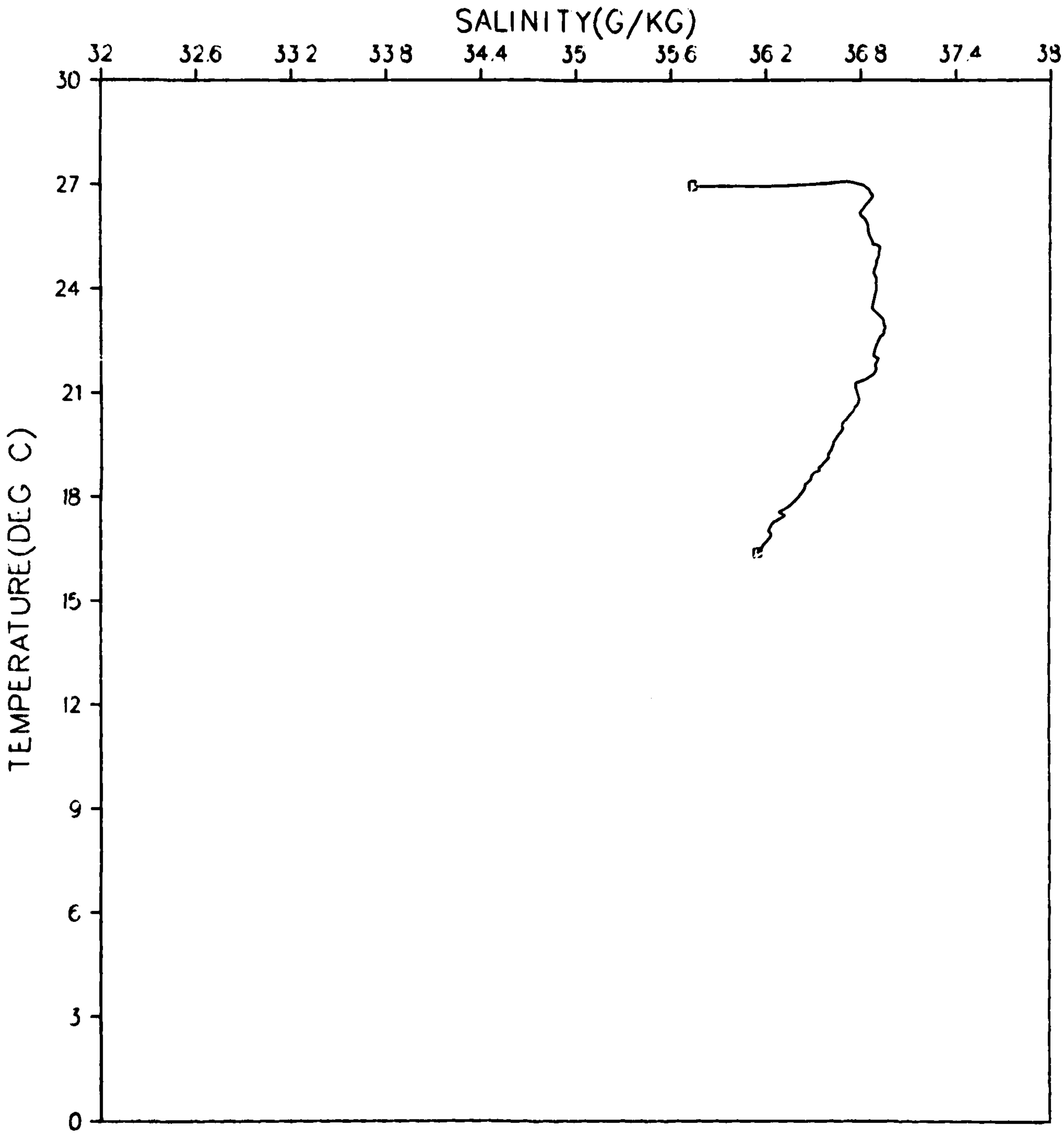


Figure 60.

GRENADA BASIN
STATION 027001
JANUARY 1980

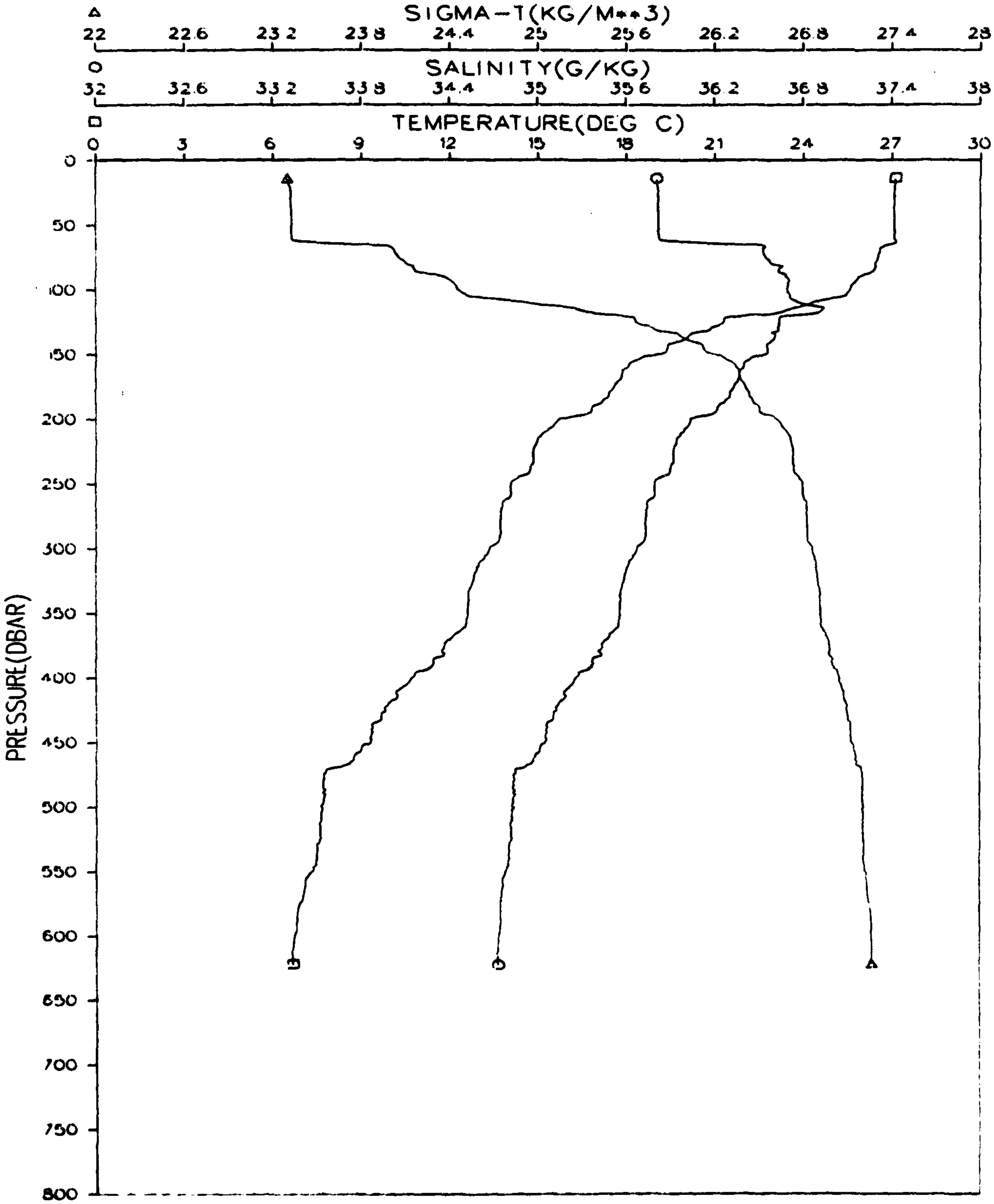


Figure 61.

GRENADA BASIN
STATION 027001
JANUARY 1980

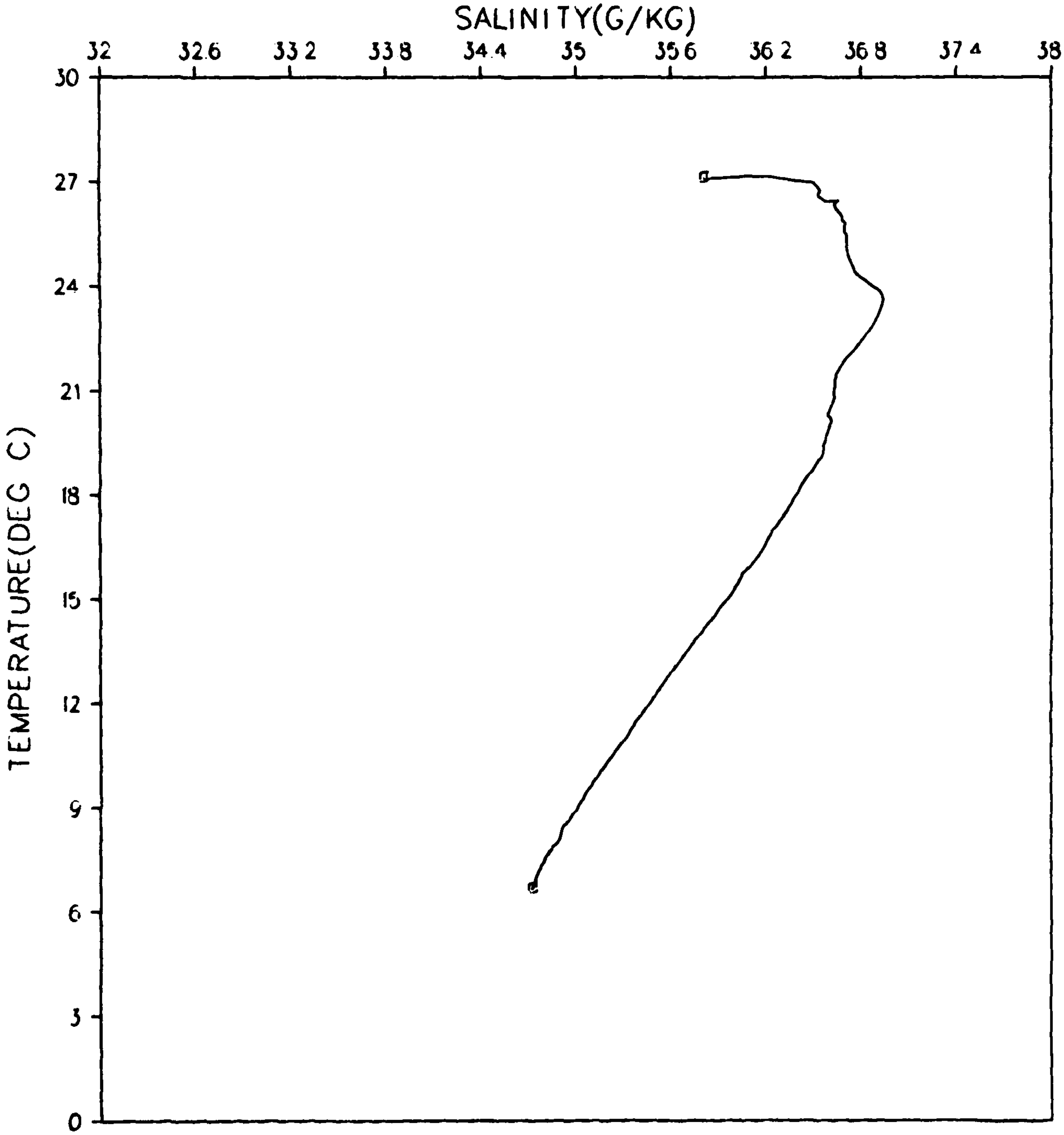


Figure 62.

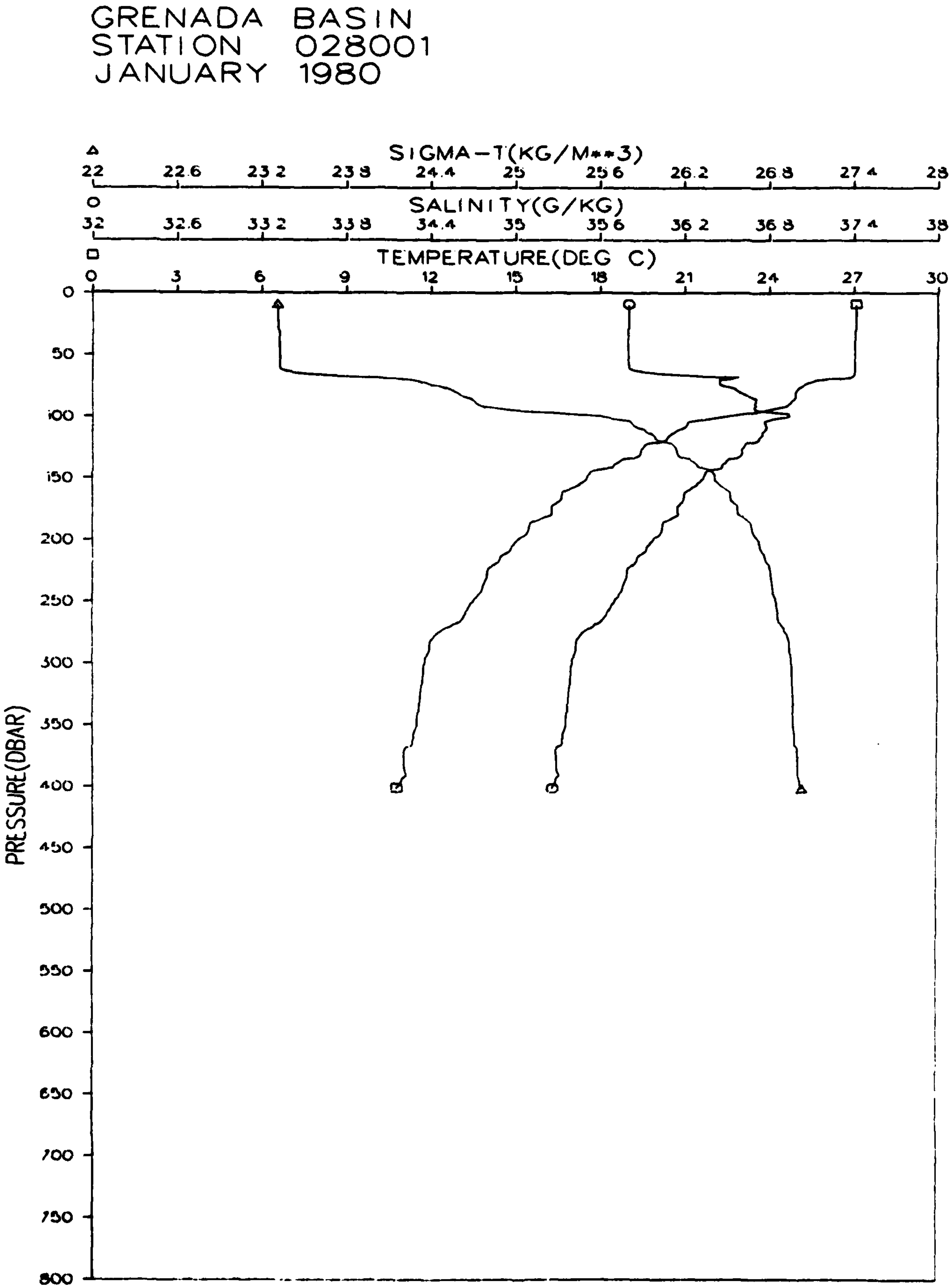
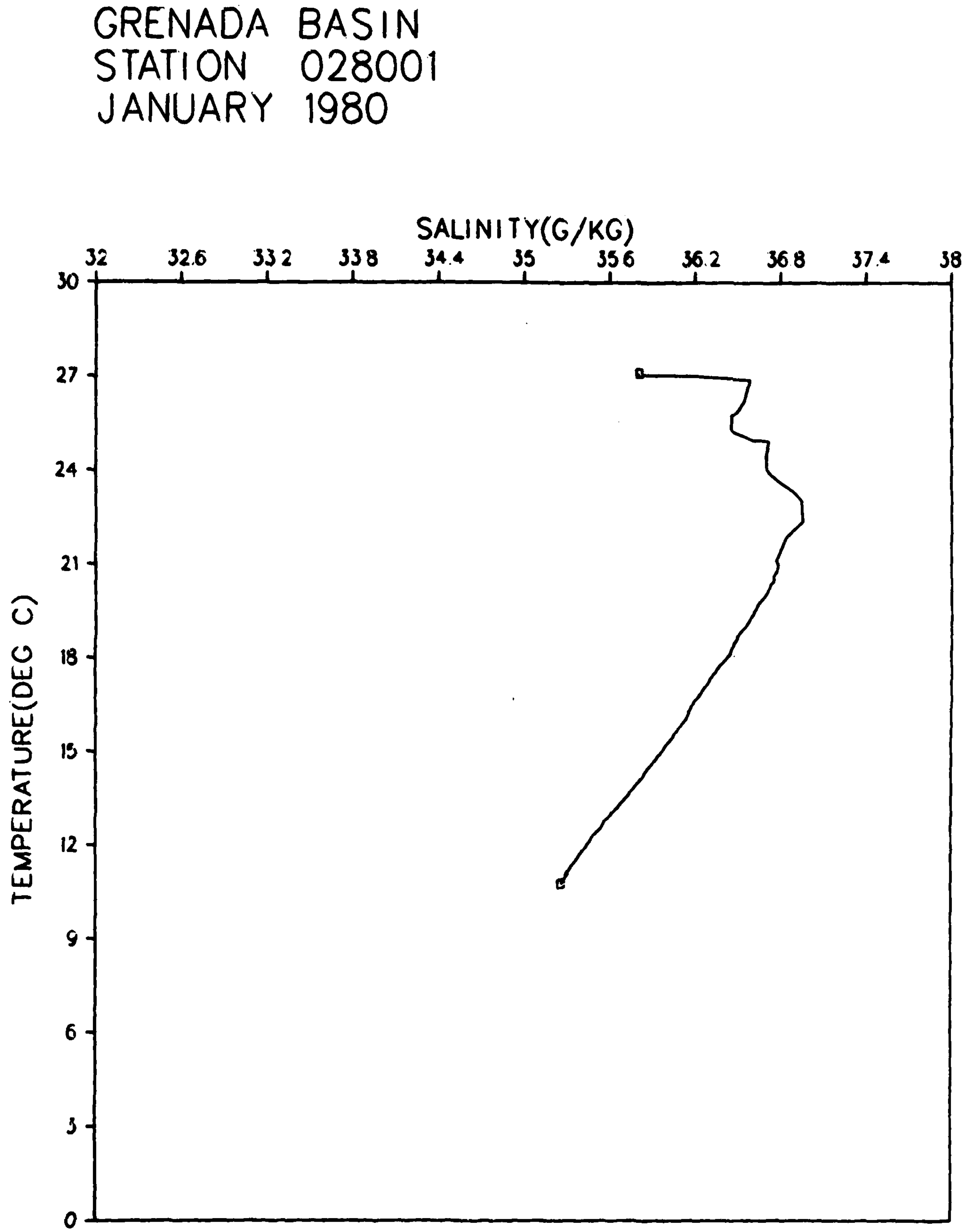
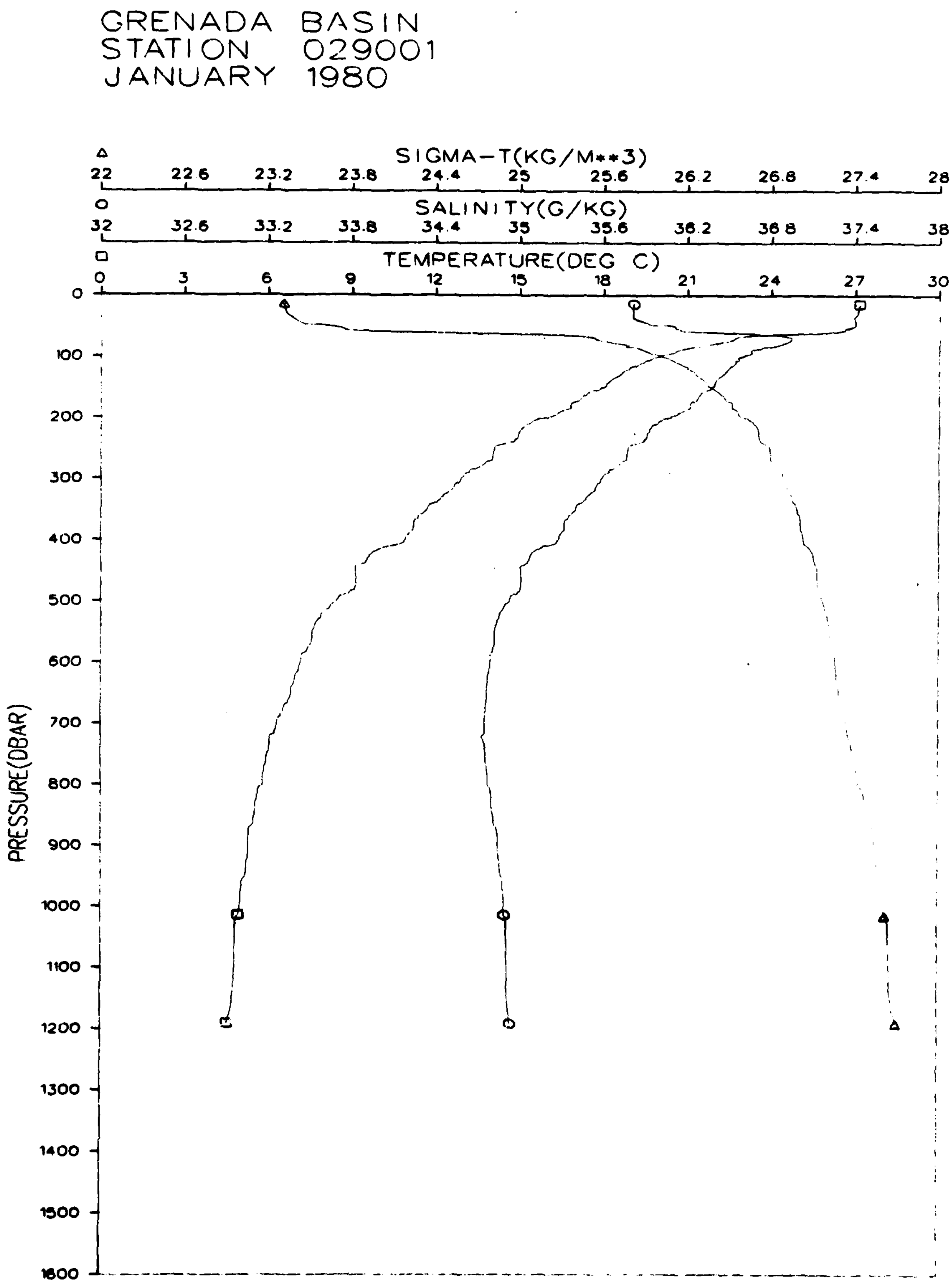

GRENADA BASIN
STATION 028001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800

Figure 63.



GRENADA BASIN
STATION 028001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 64.



GRENADA BASIN
STATION 029001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 65.

GRENADA BASIN
STATION 029001
JANUARY 1980

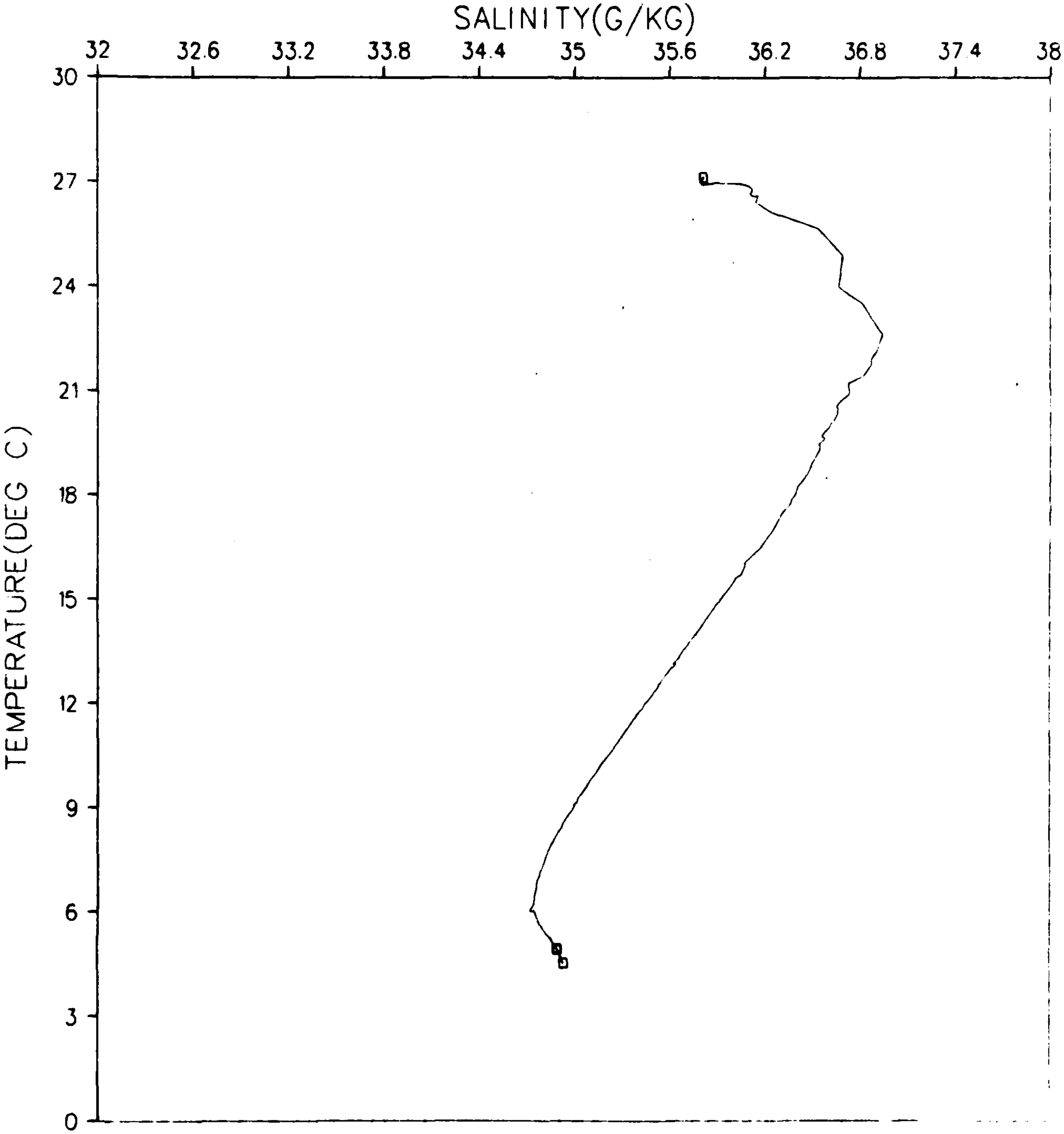


Figure 66.

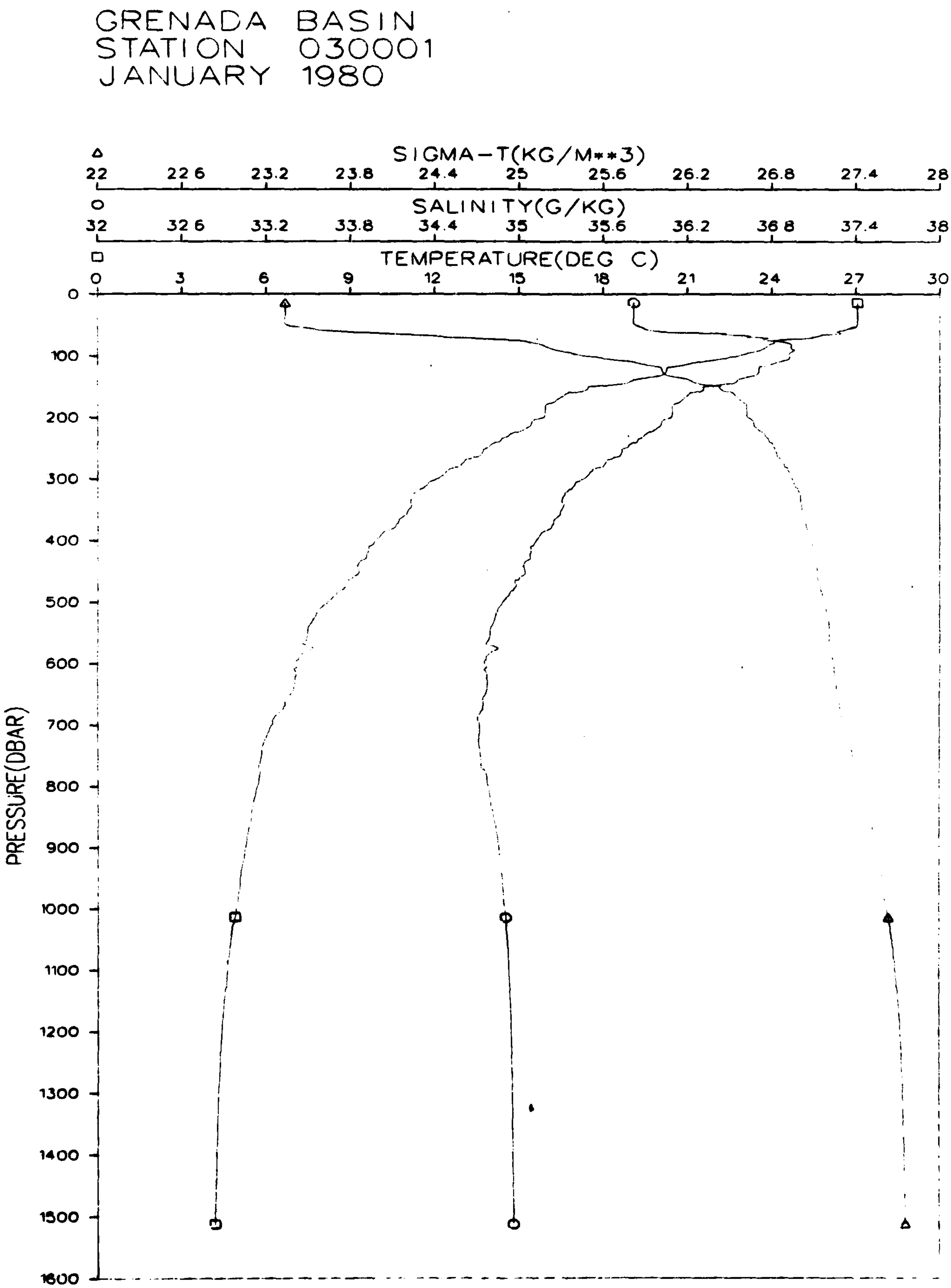

GRENADA BASIN
STATION 030001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 67.

GRENADA BASIN
STATION 030001
JANUARY 1980

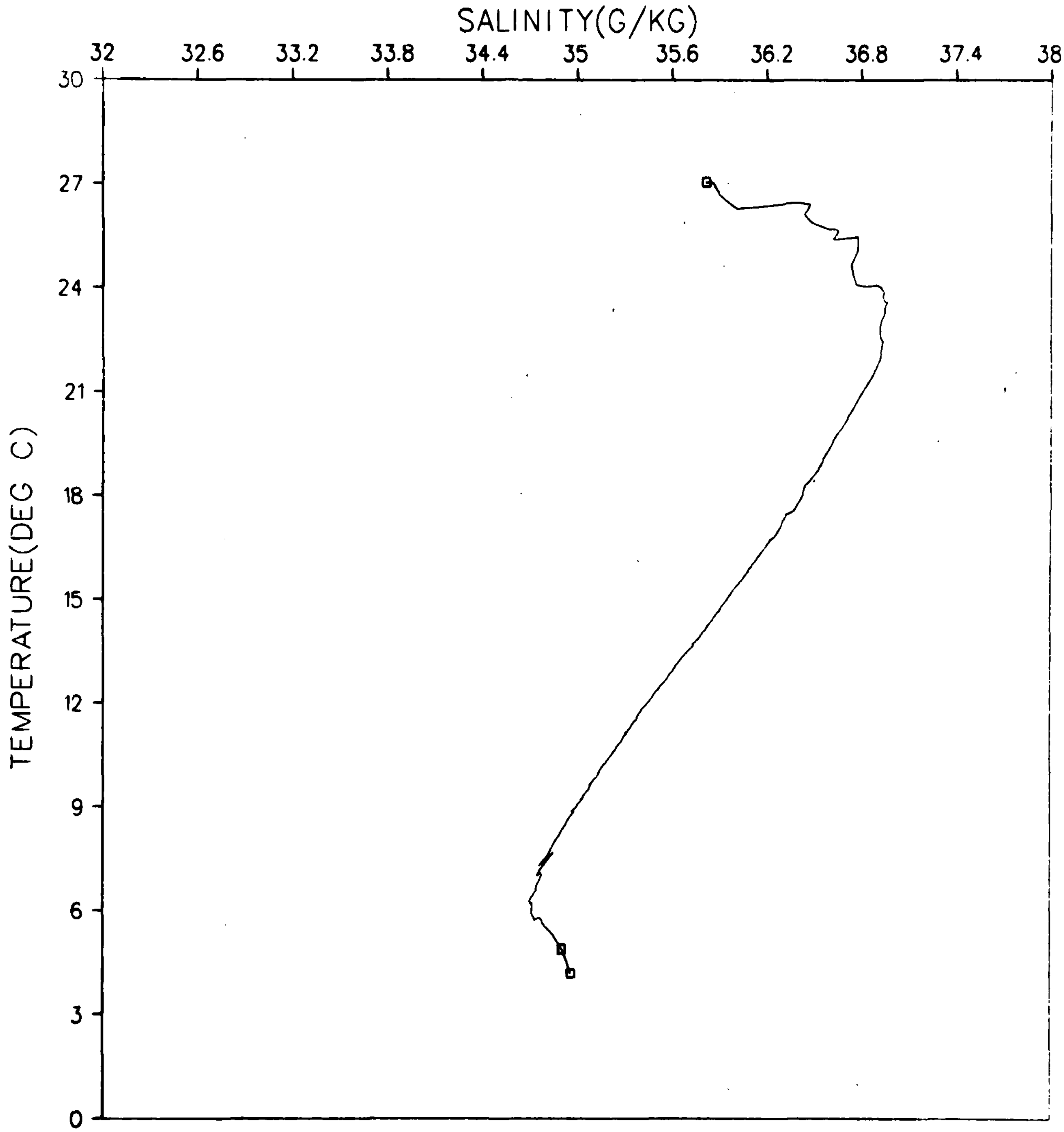


Figure 68.

AD-A103 960 NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY NSTL S--ETC F/G 8/10
HYDROGRAPHIC MEASUREMENTS IN THE GRENADA BASIN, SOUTHEASTERN CA--ETC(U)
JUN 81 D A BURNS, M A GOVE, N V LOMBARD

UNCLASSIFIED NORDA-TN-86 NL

ADA
103960

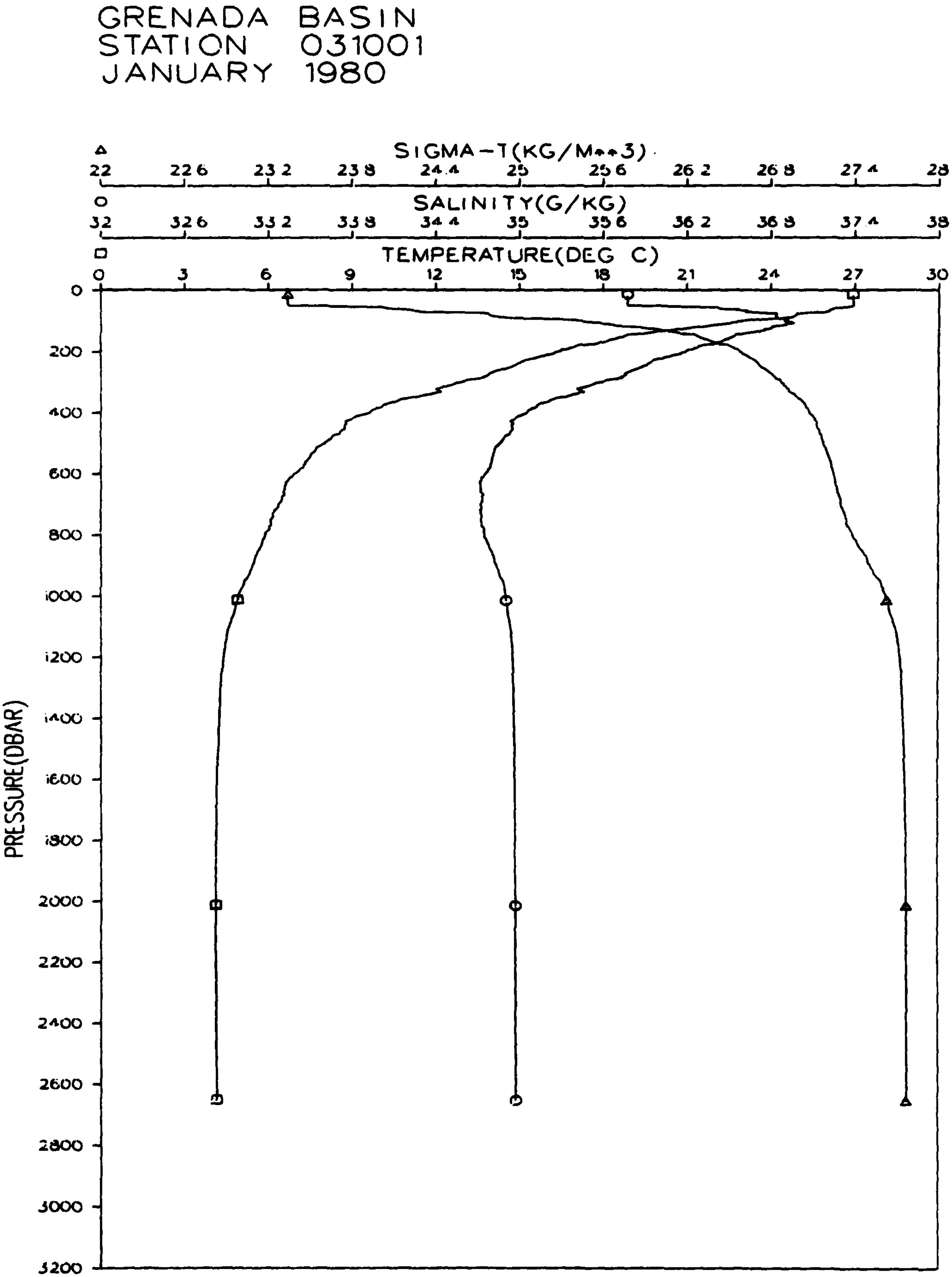

GRENADA BASIN
STATION 031001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200

Figure 69.

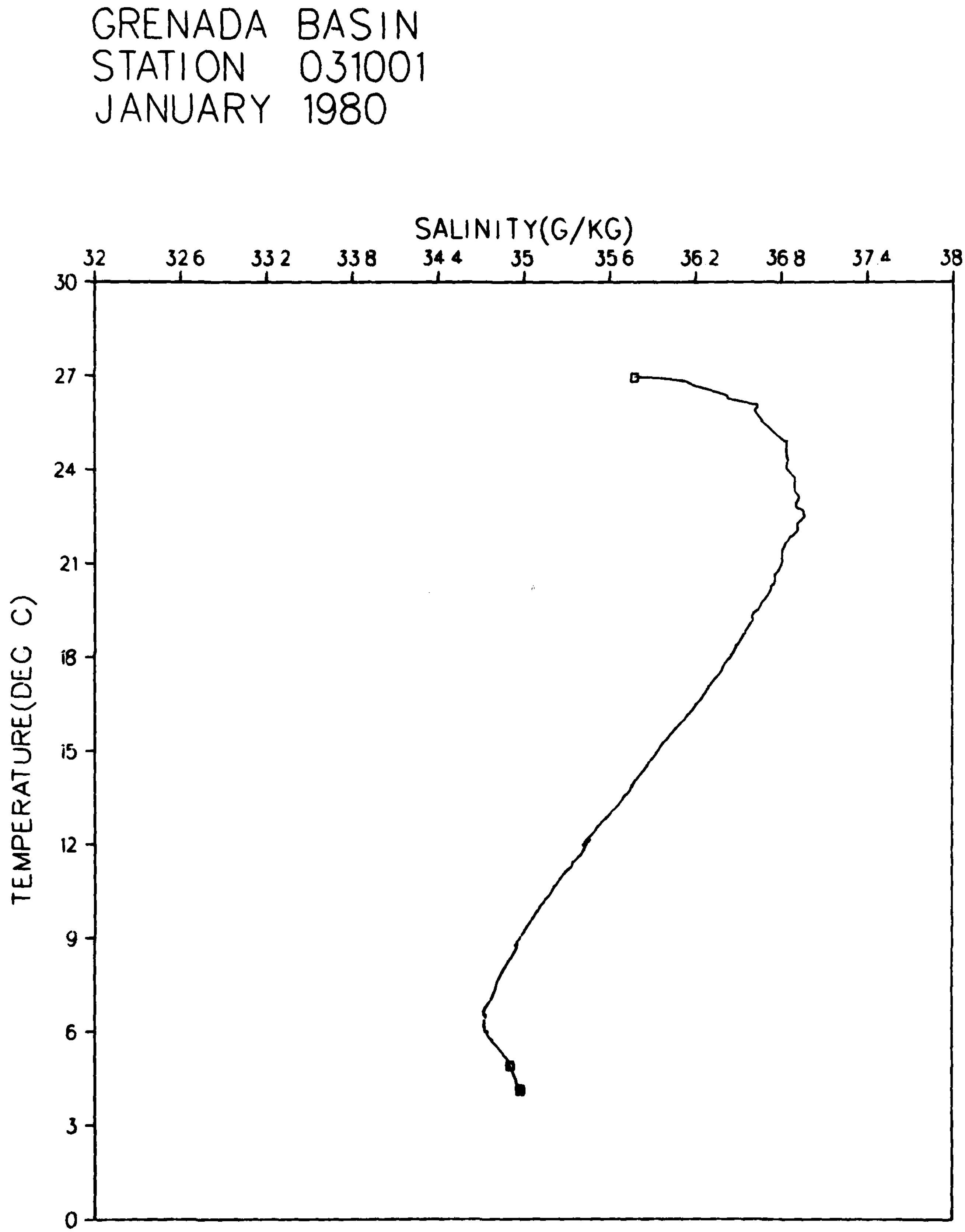

GRENADA BASIN
STATION 031001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 70.

GRENADA BASIN
STATION 032001
JANUARY 1980

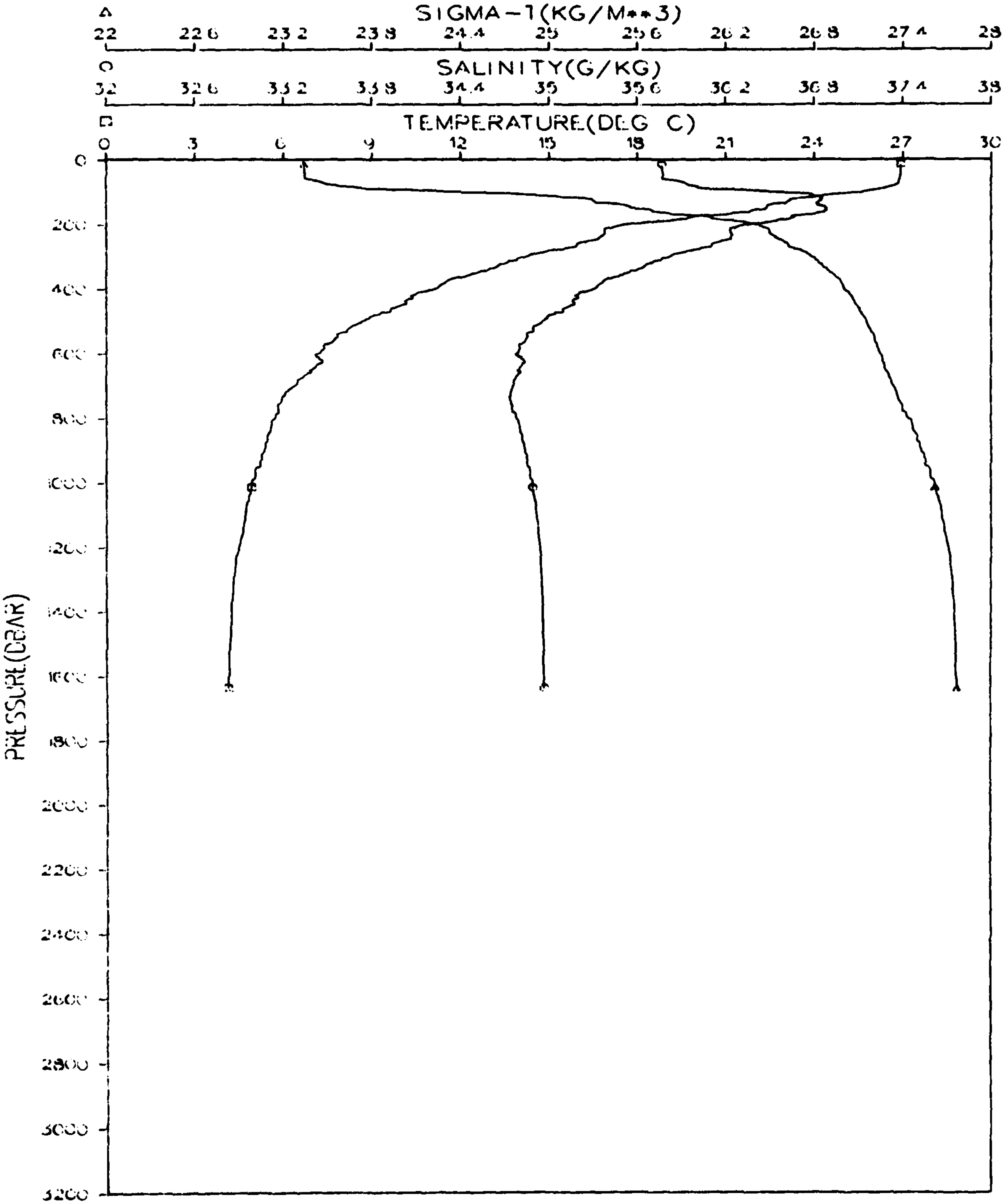


Figure 71.

GRENADA BASIN
STATION 032001
JANUARY 1980

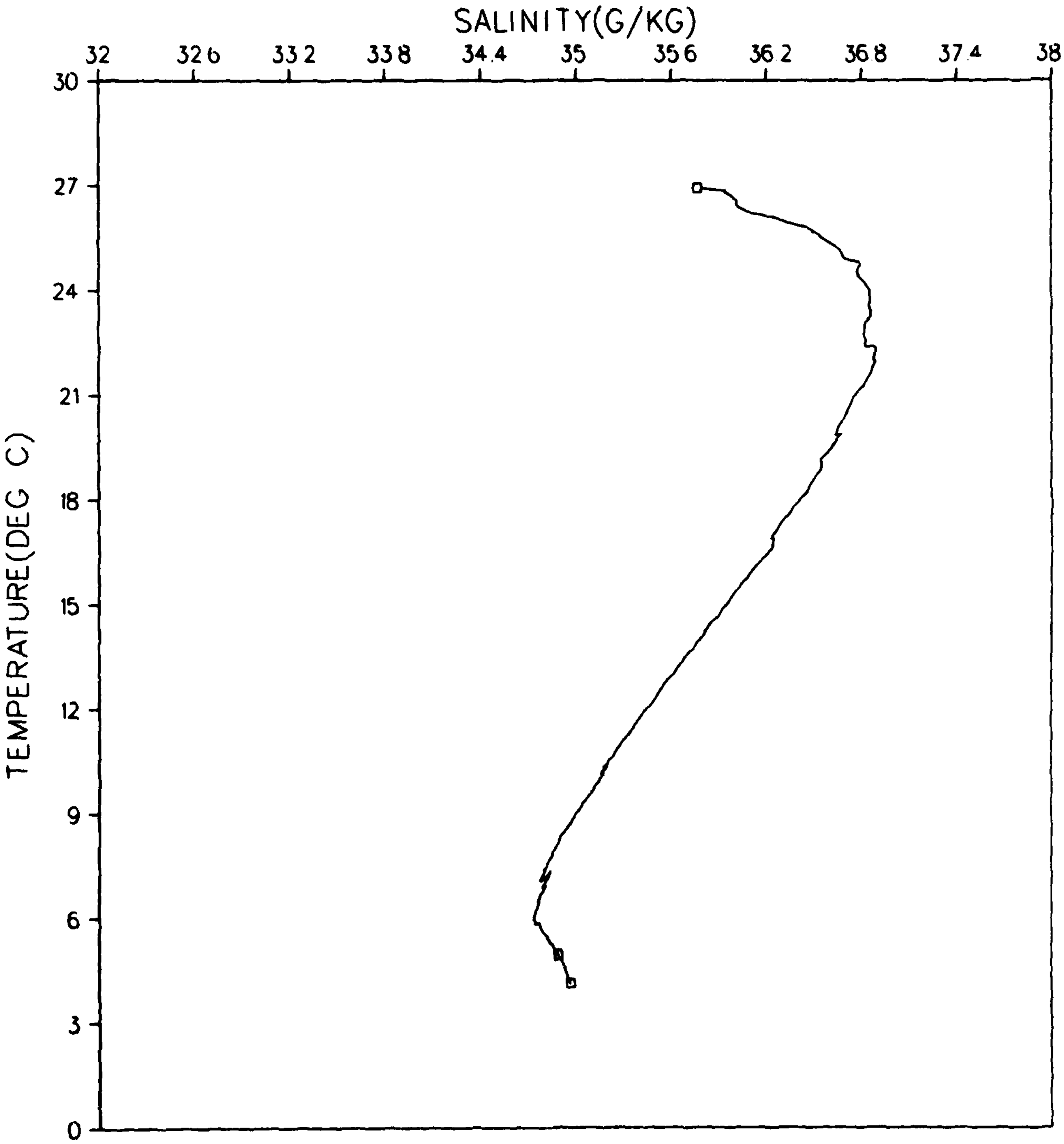


Figure 72.

GRENADA BASIN
STATION 033001
JANUARY 1980

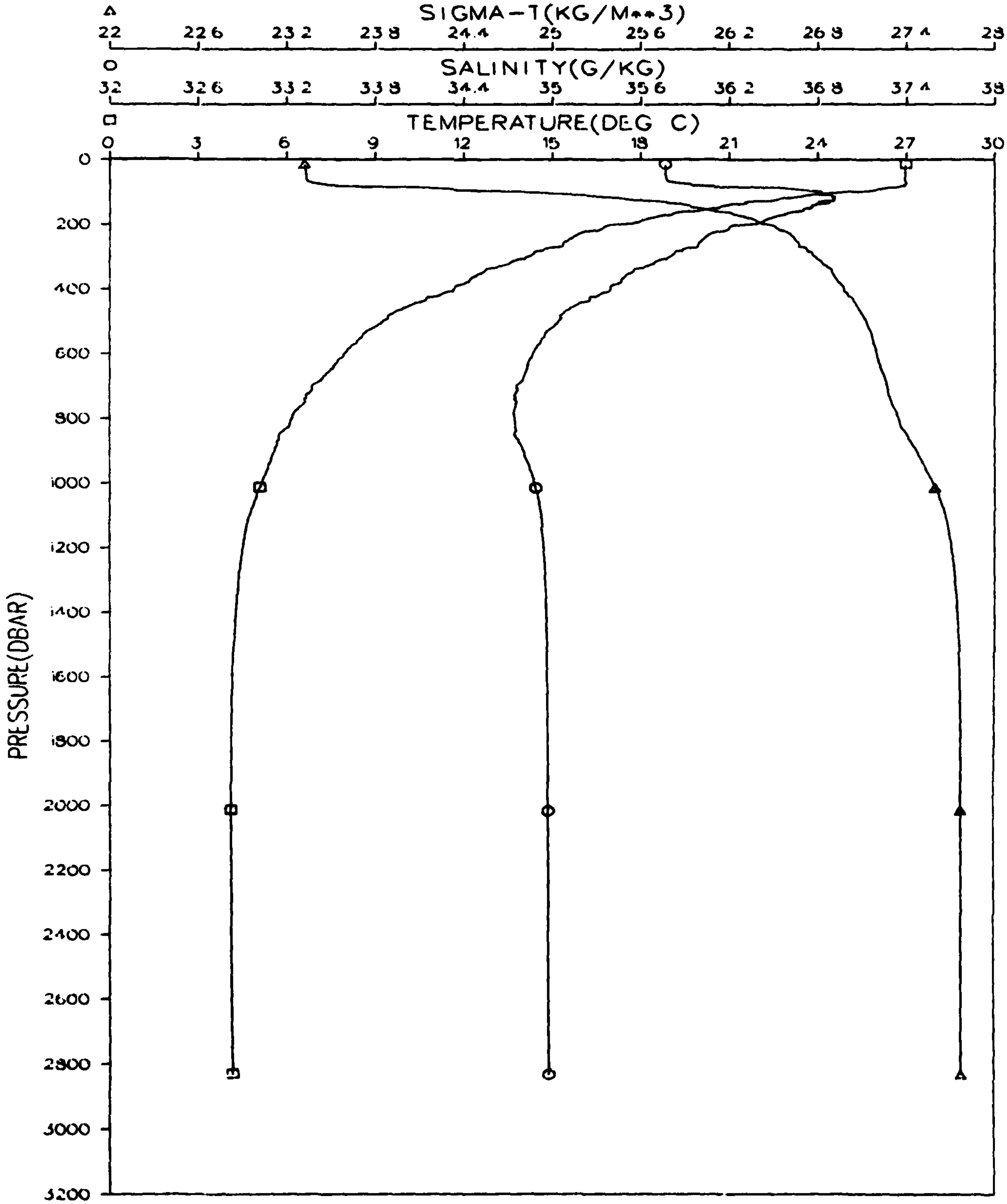


Figure 73.

GRENADA BASIN
STATION 033001
JANUARY 1980

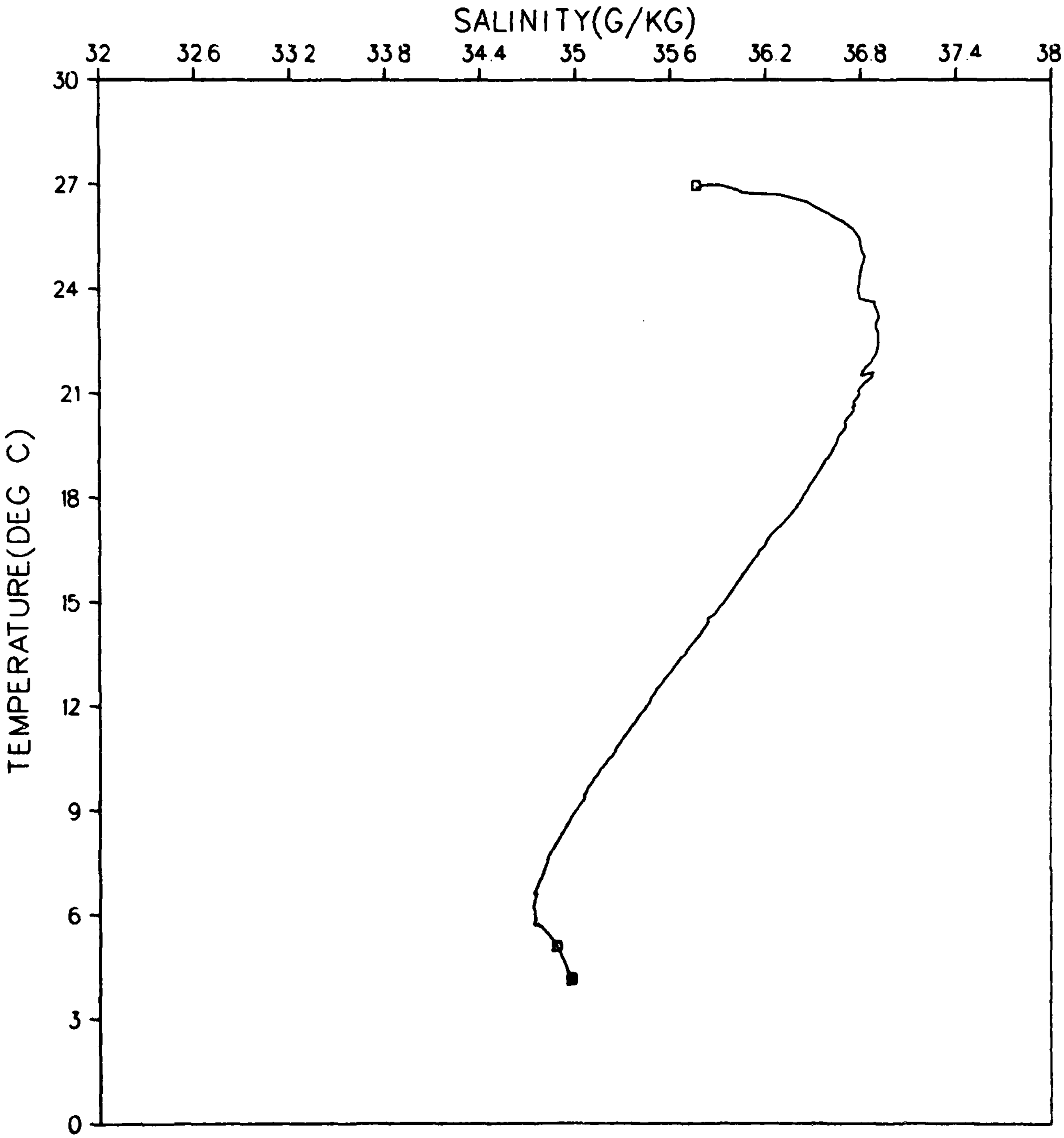


Figure 74.

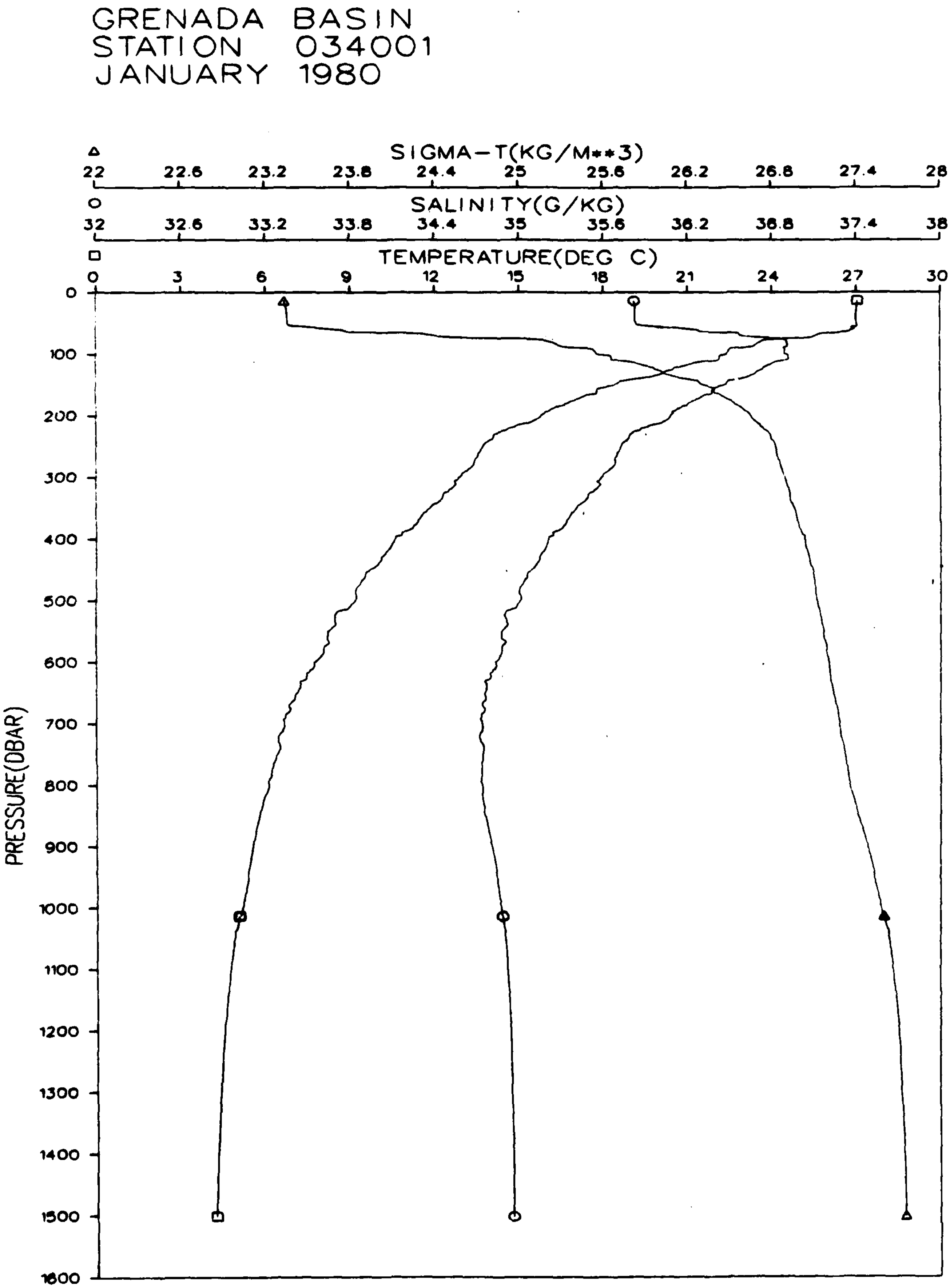

GRENADA BASIN
STATION 034001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 75.

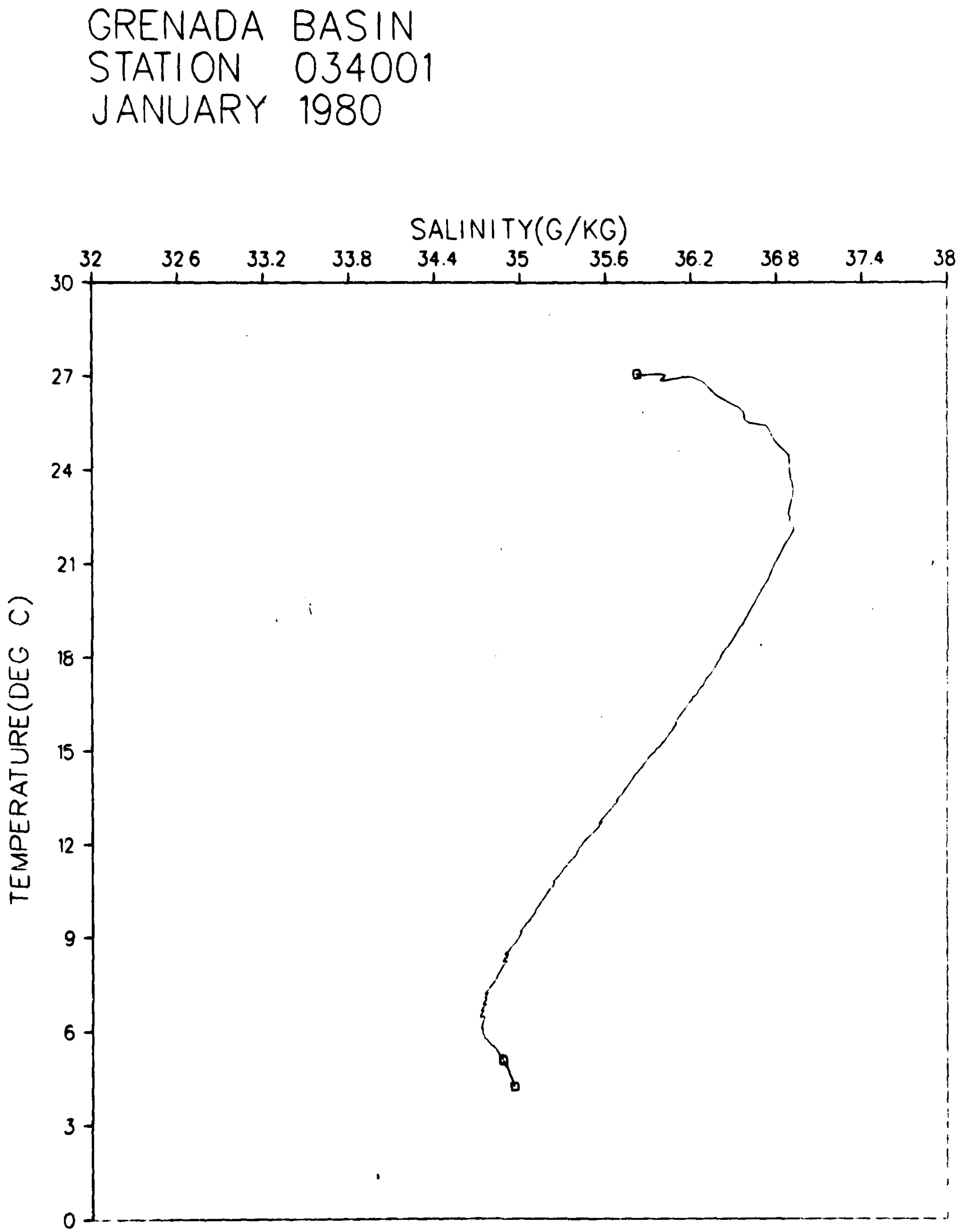

GRENADA BASIN
STATION 034001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 76.

GRENADA BASIN
STATION 035001
JANUARY 1980

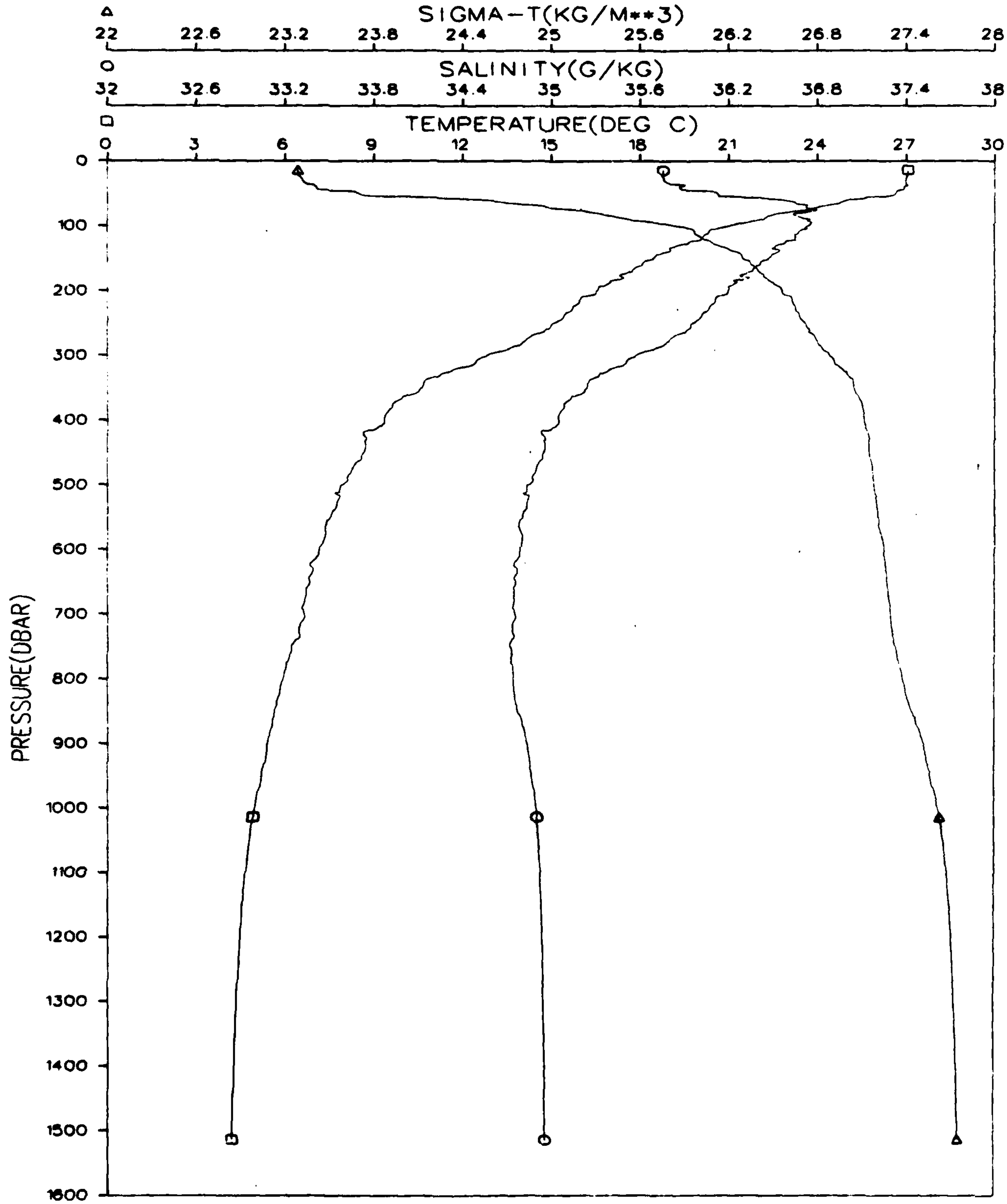
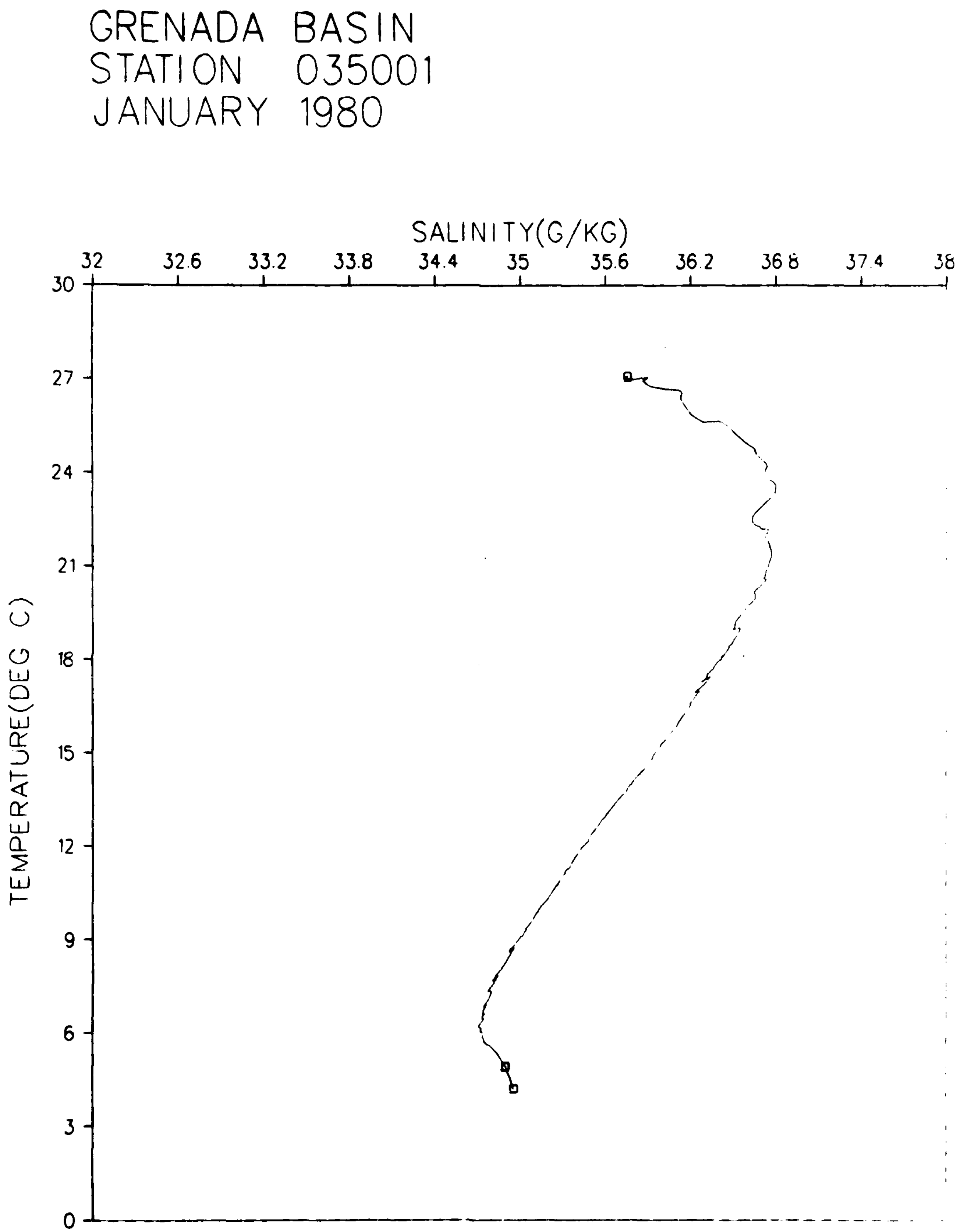


Figure 77.



GRENADA BASIN
STATION 035001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 78.

GRENADA BASIN
STATION 036001
JANUARY 1980

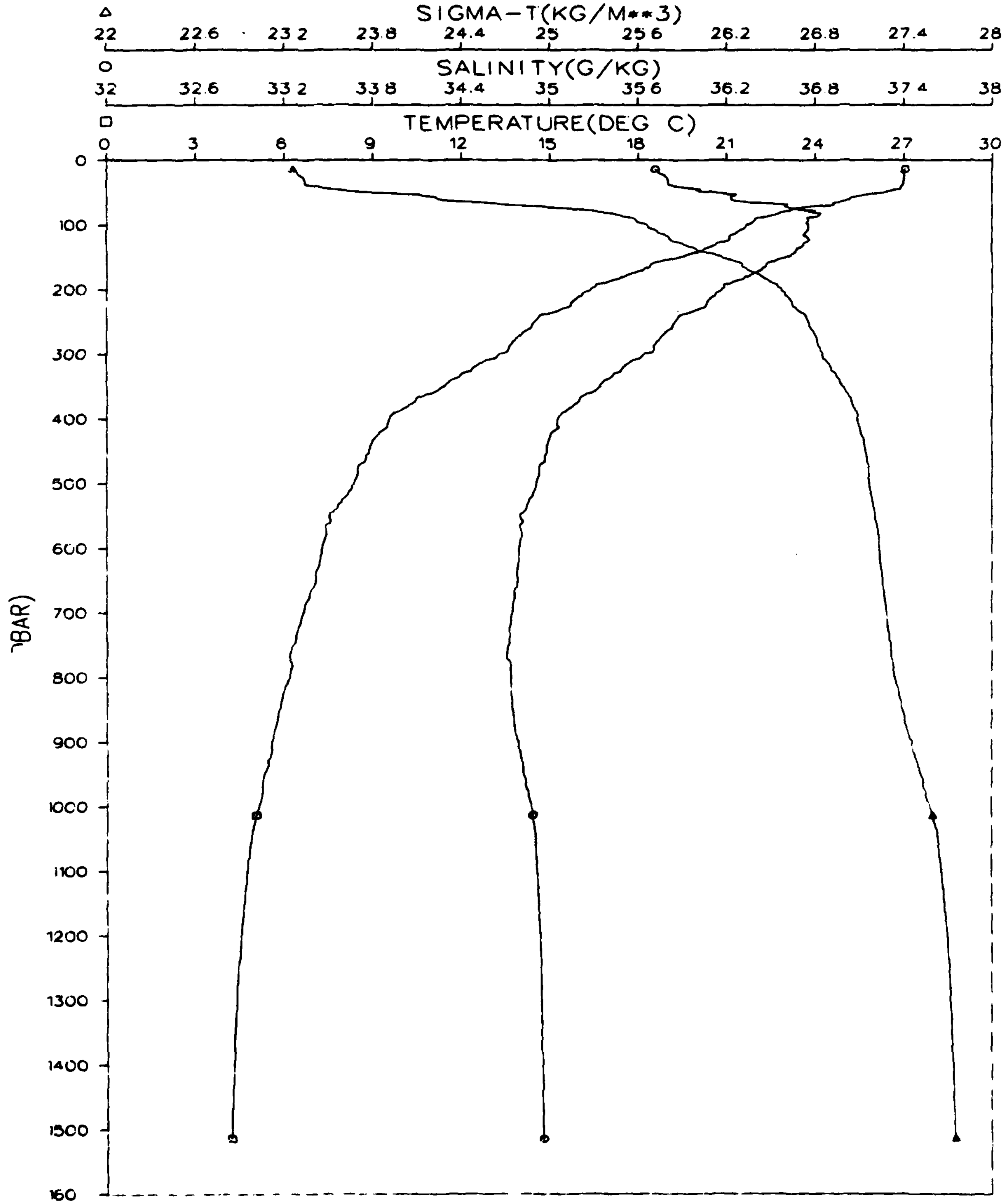


Figure 79.

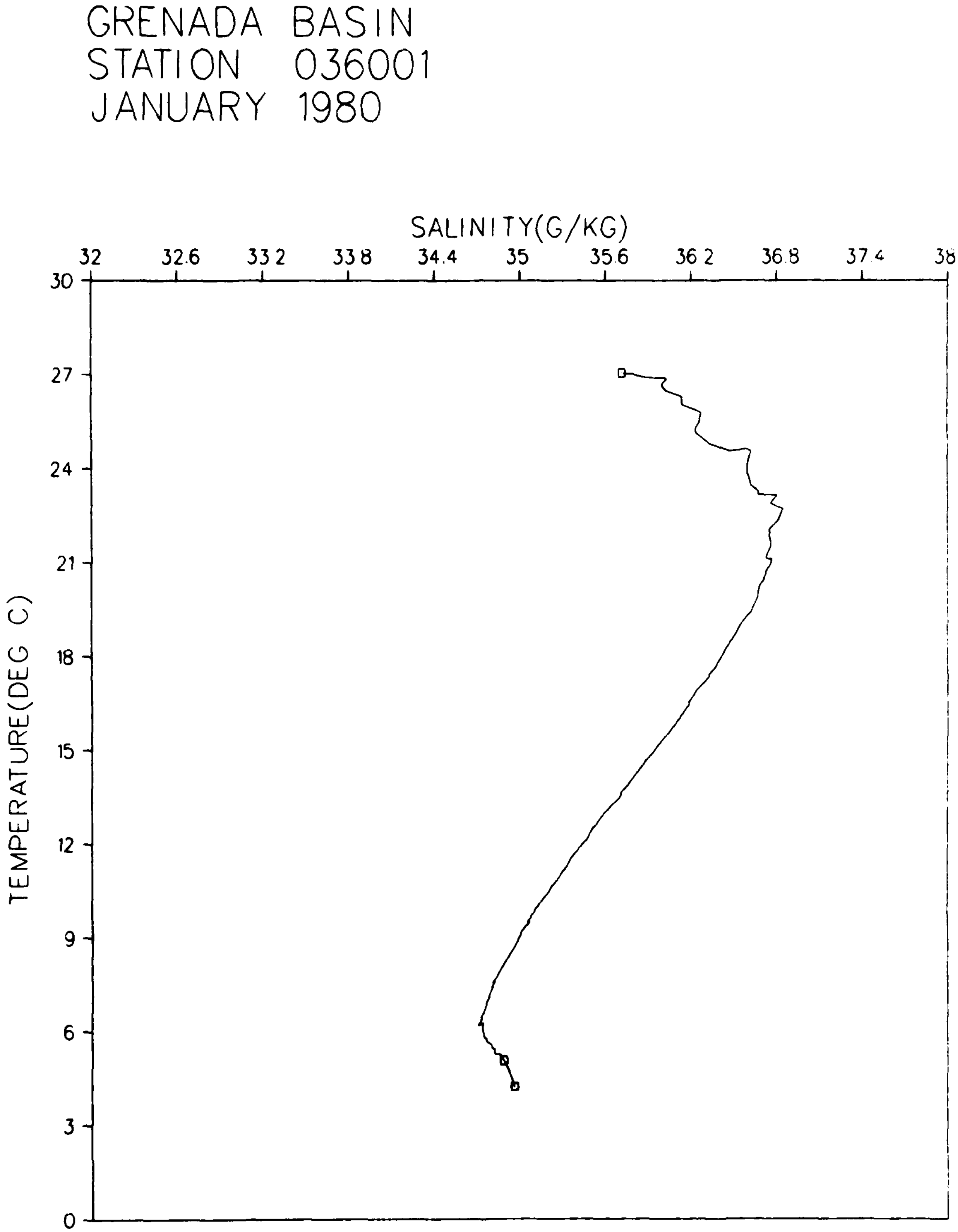

GRENADA BASIN
STATION 036001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 80.

GRENADA BASIN
STATION 037001
JANUARY 1980

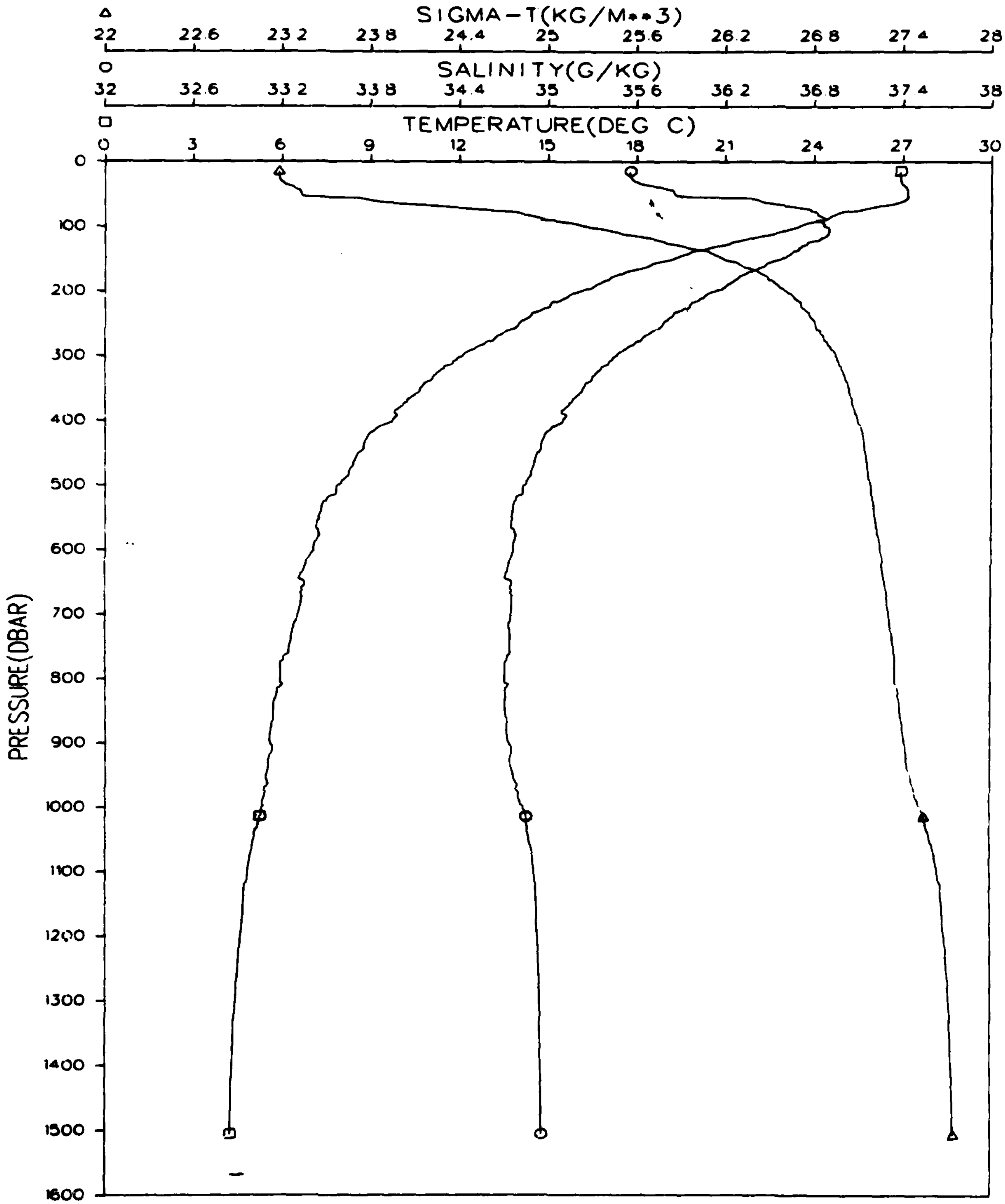


Figure 81.

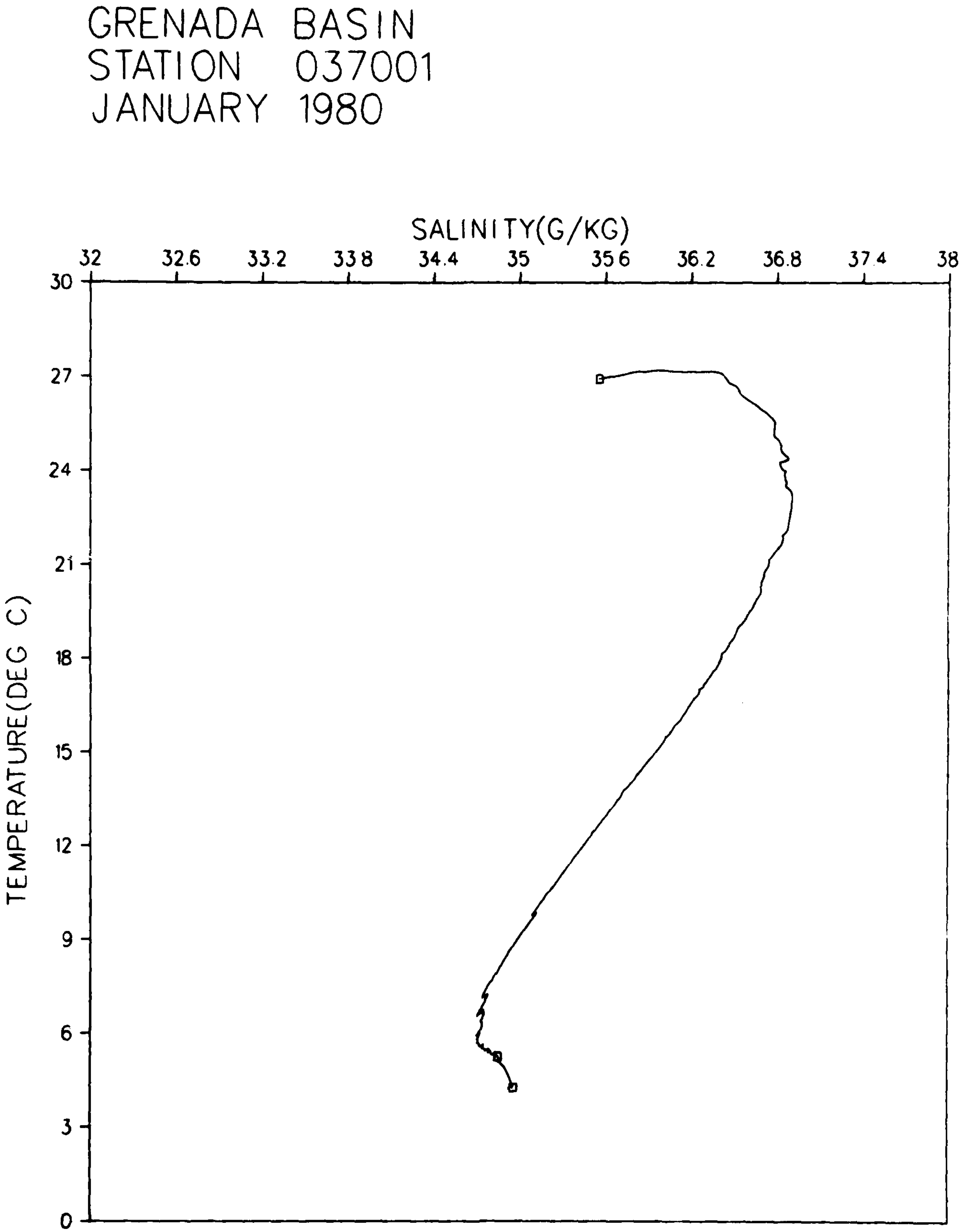

GRENADA BASIN
STATION 037001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 82.

GRENADA BASIN
STATION 038001
JANUARY 1980

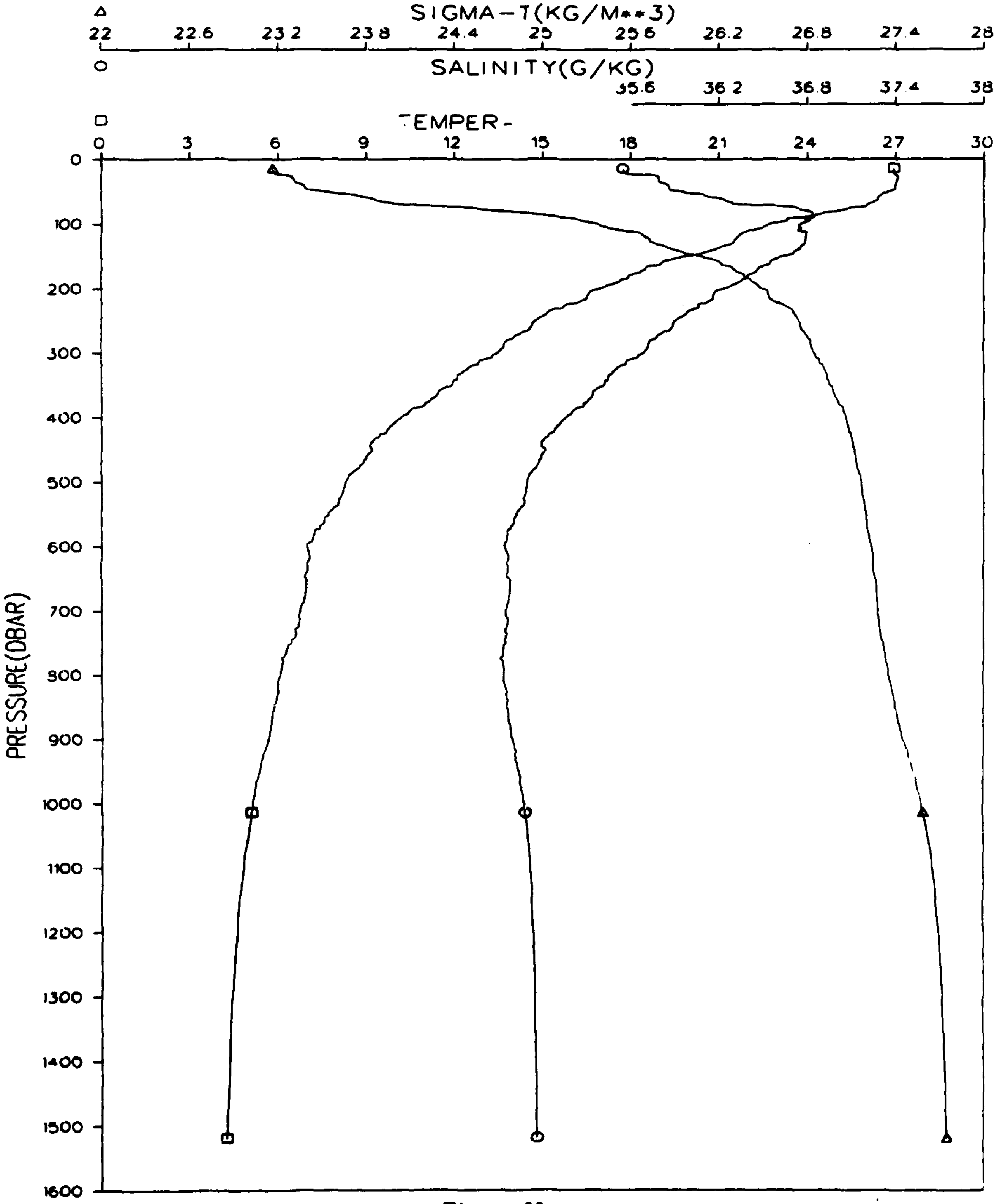


Figure 83.

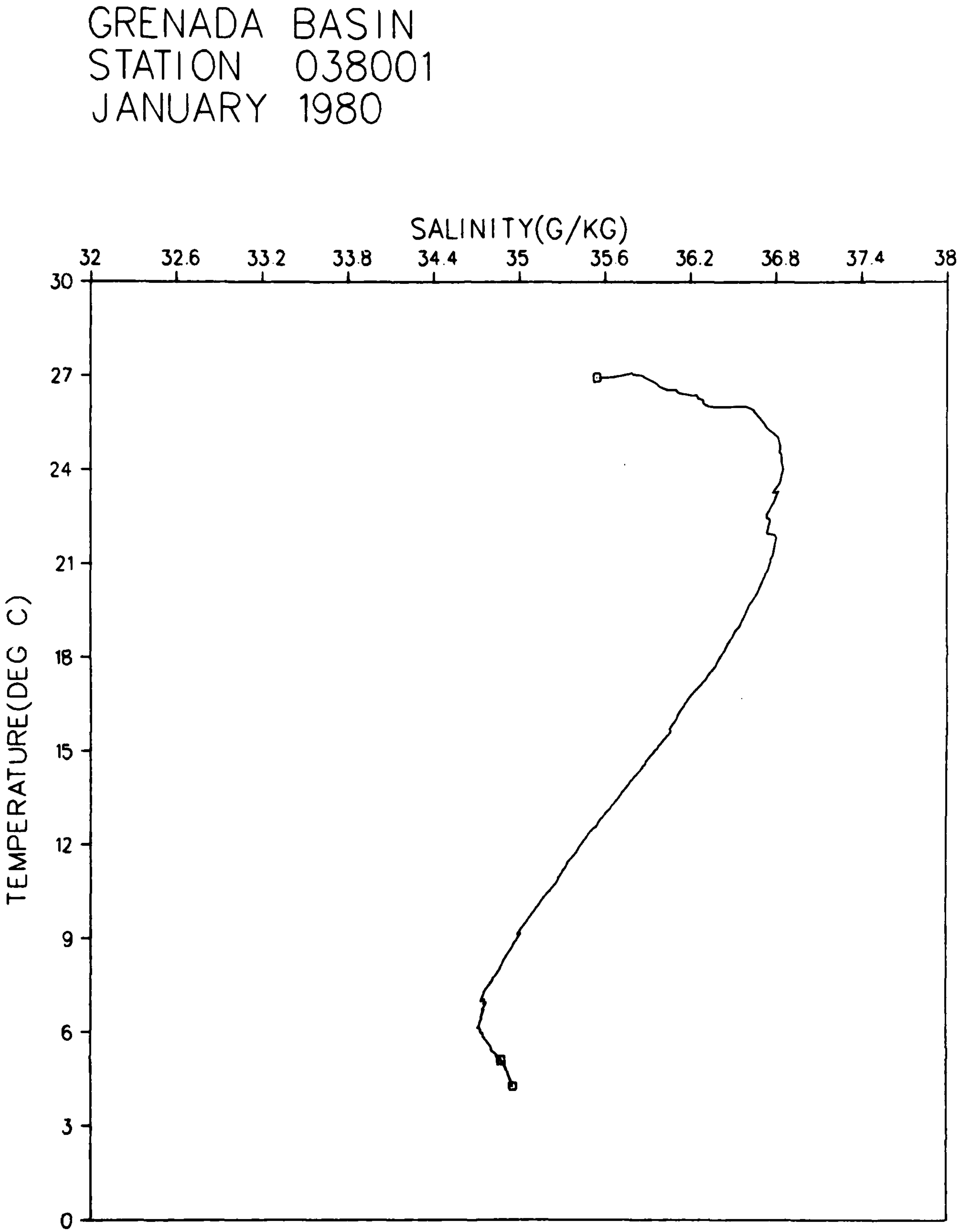

GRENADA BASIN
STATION 038001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 84.

GRENADA BASIN
STATION 039001
JANUARY 1980

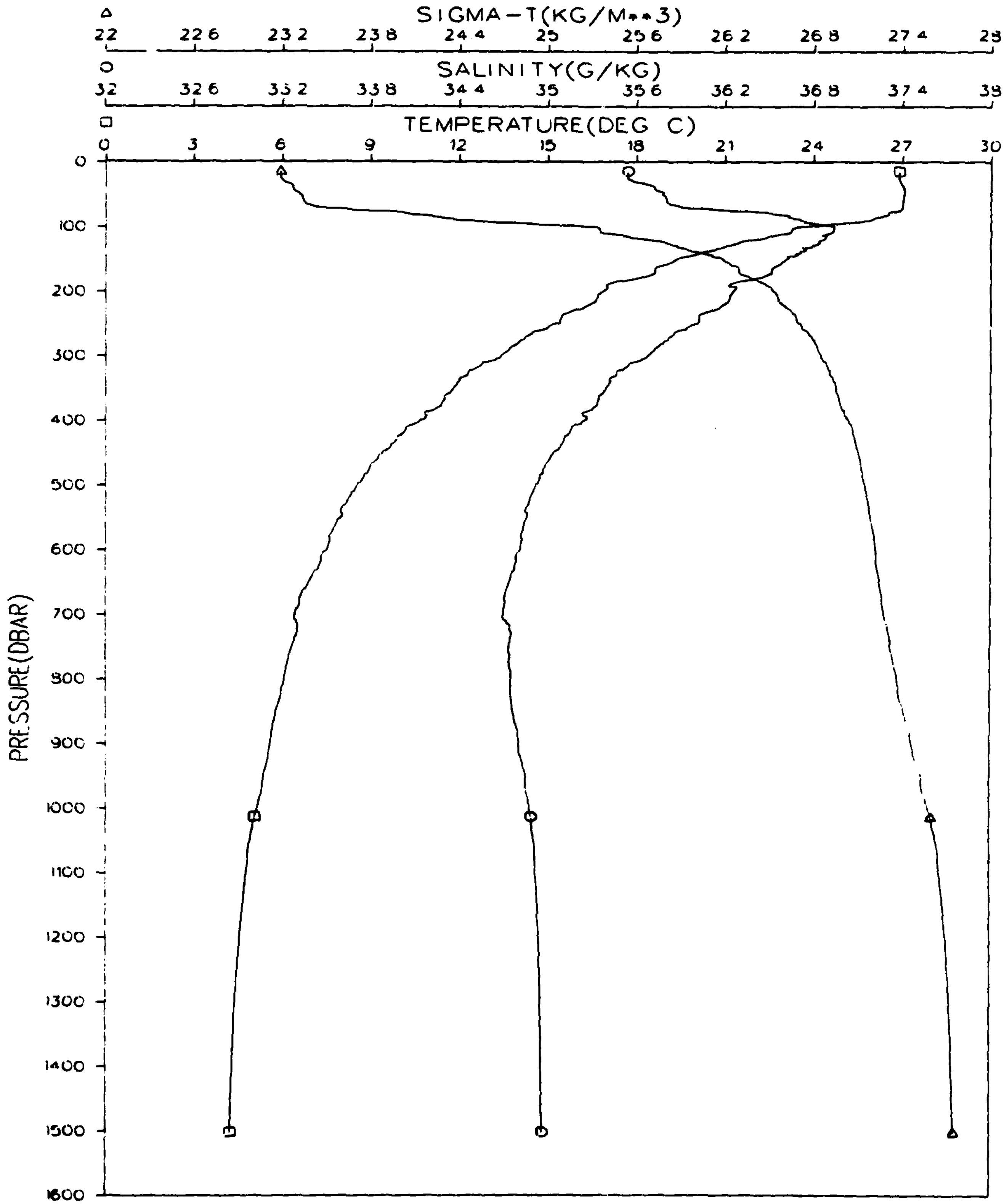


Figure 85.

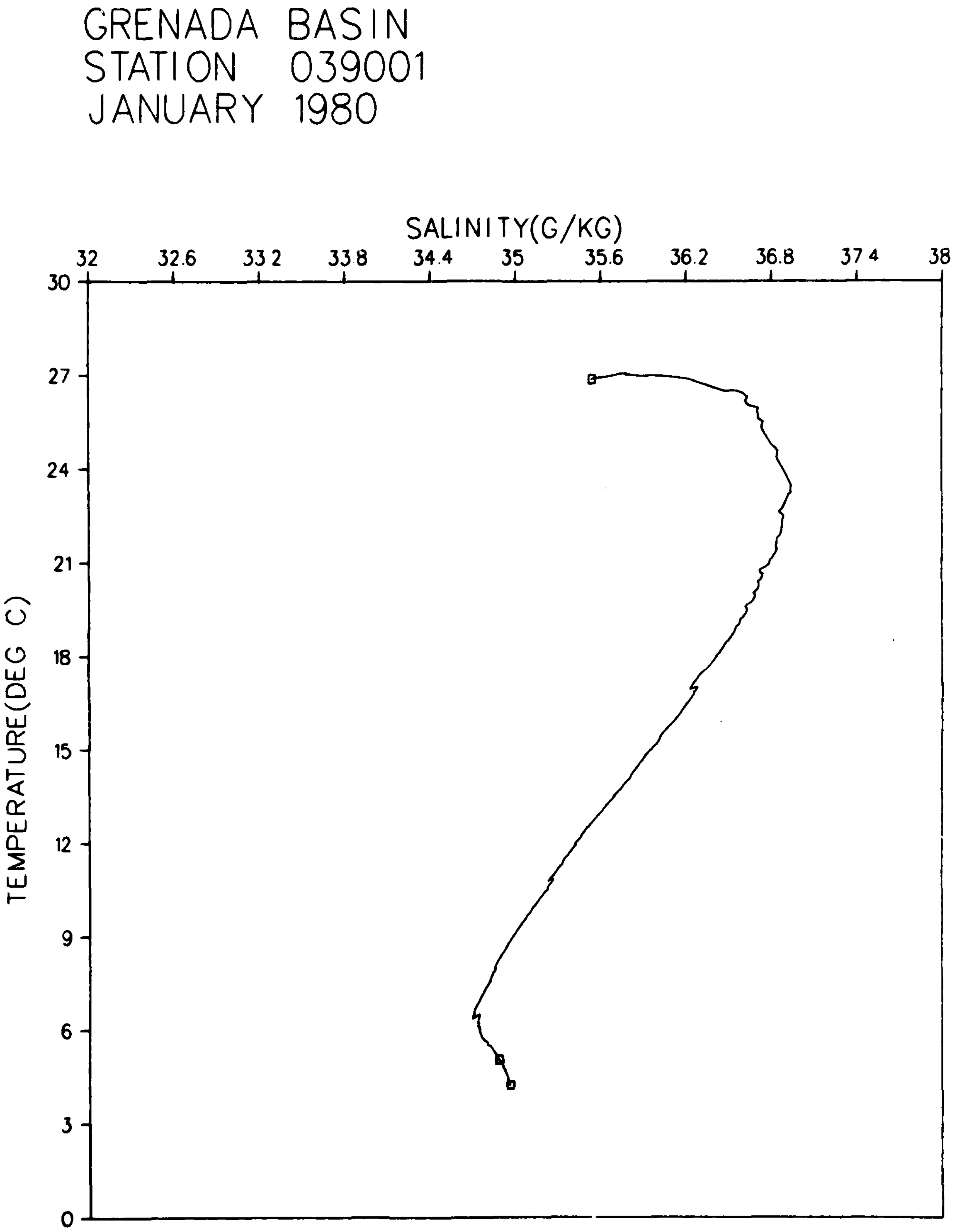
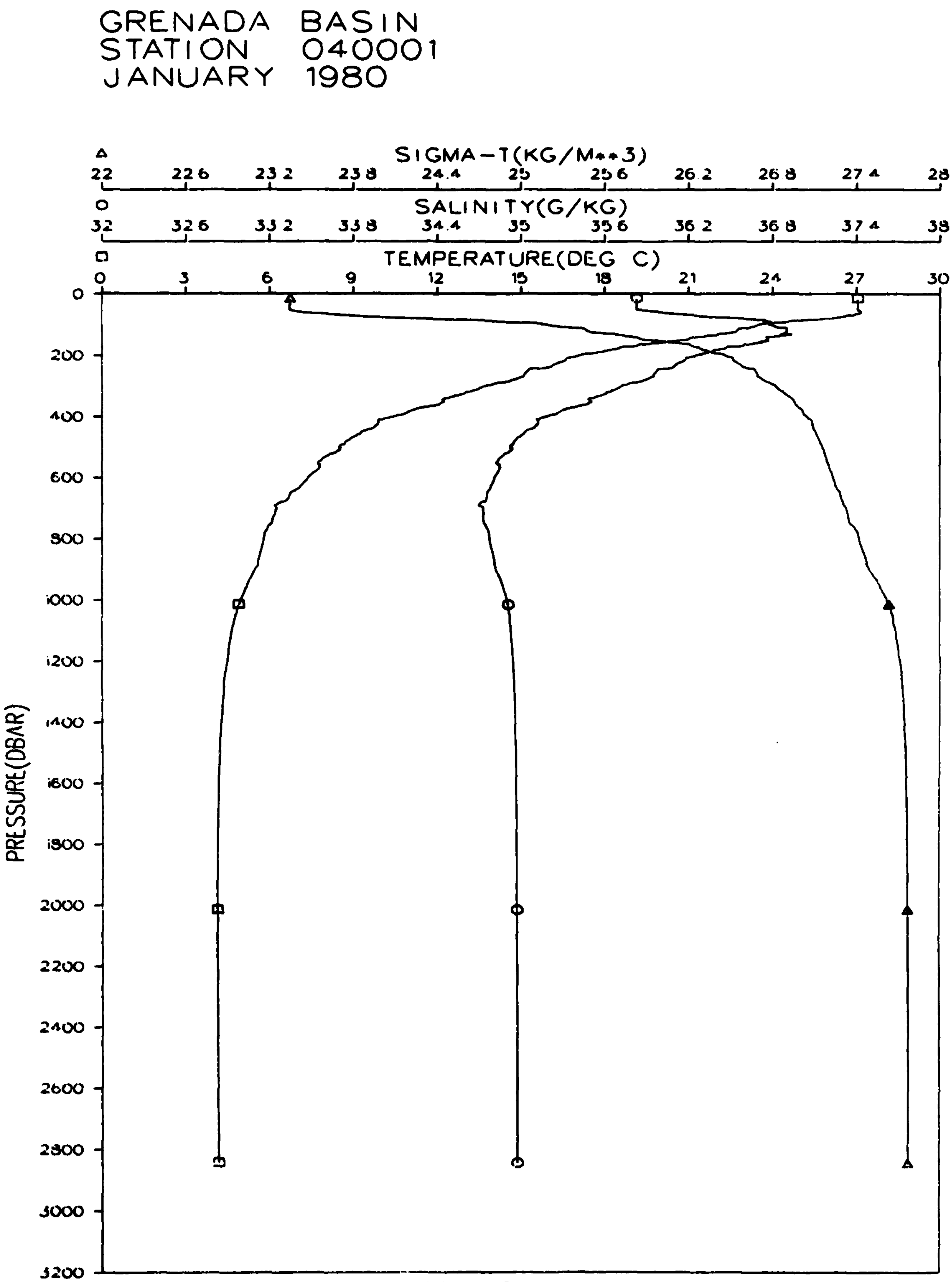

GRENADA BASIN
STATION 039001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 86.



GRENADA BASIN
STATION 040001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200

Figure 87.

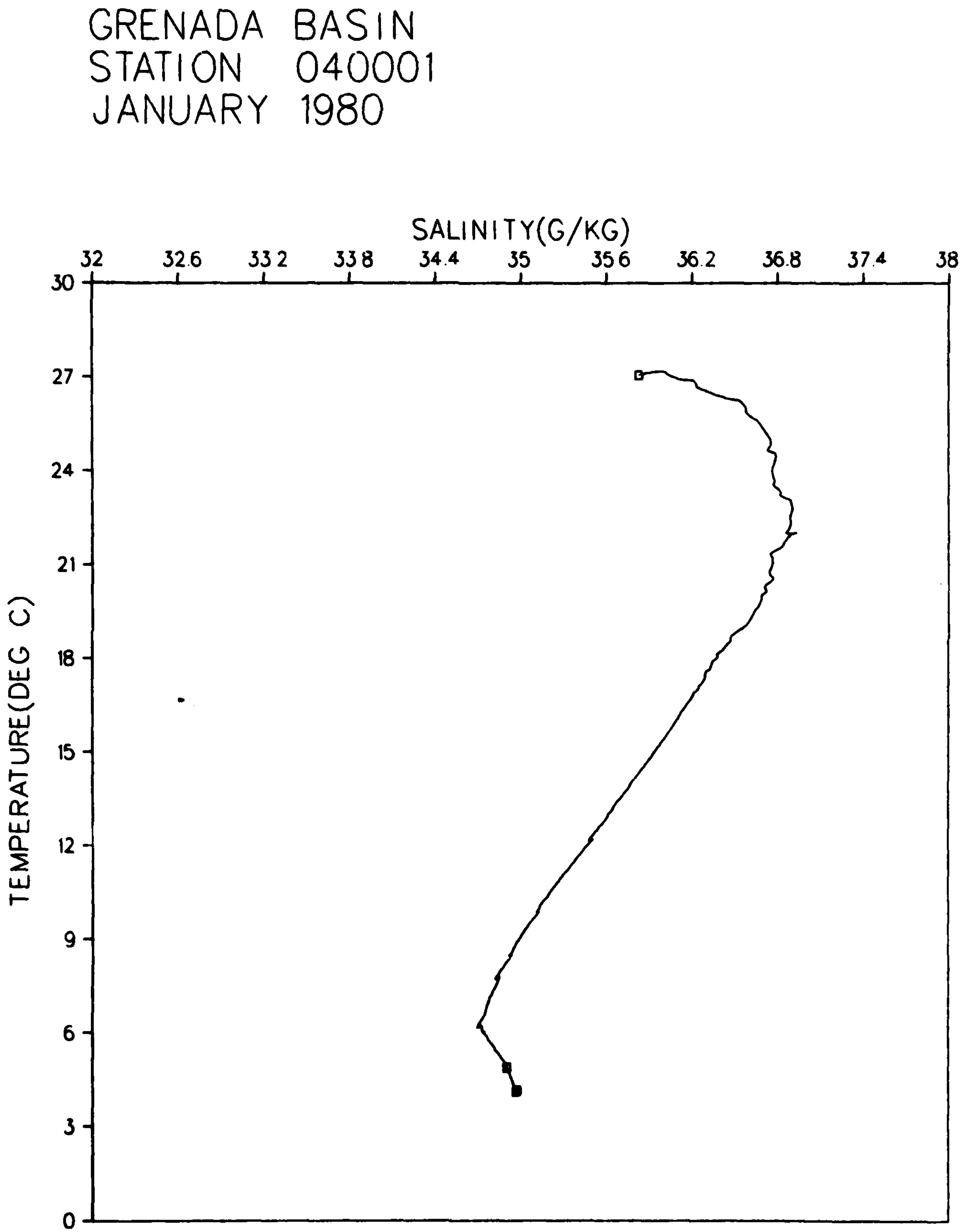

GRENADA BASIN
STATION 040001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 88.

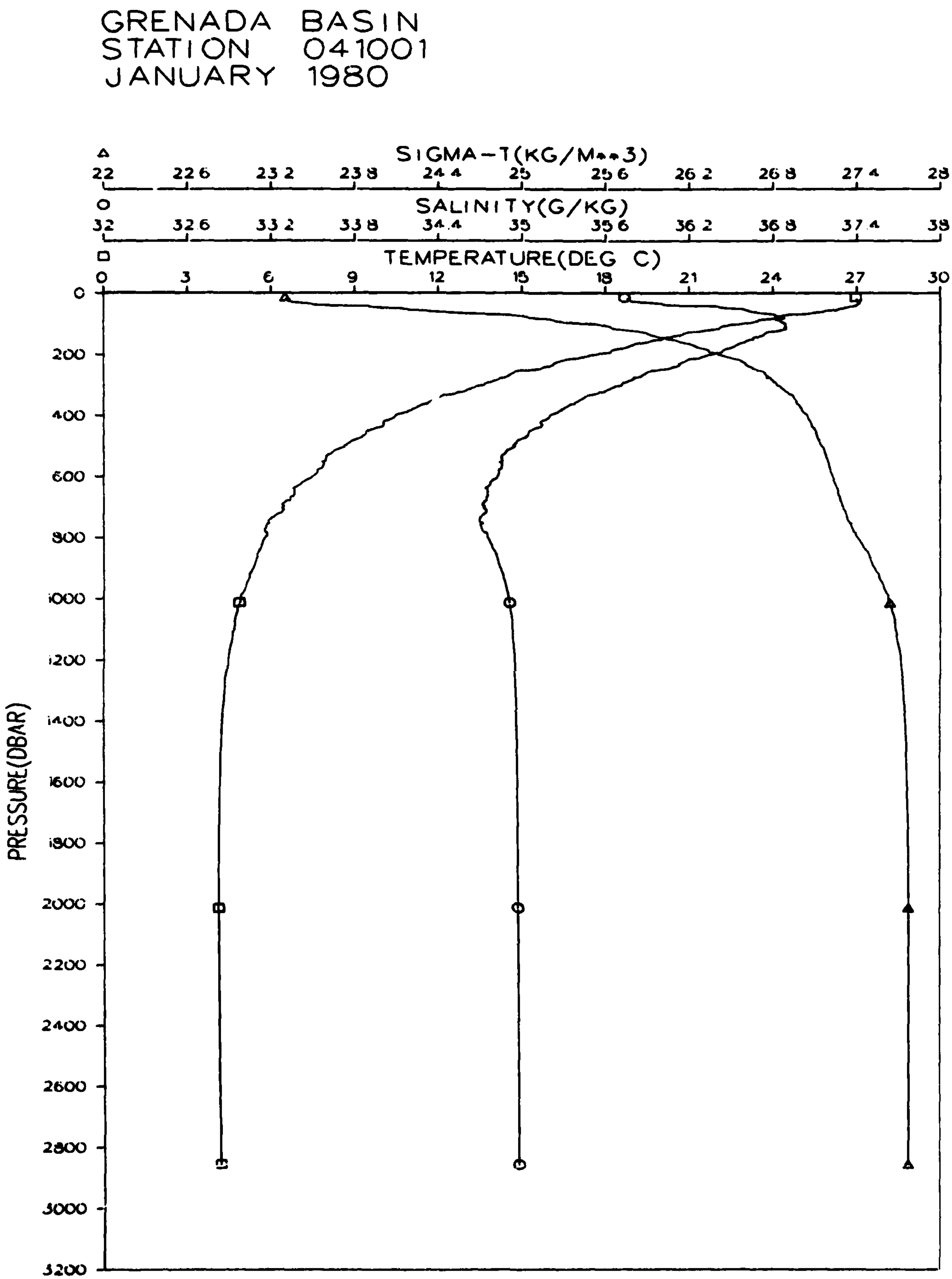

GRENADA BASIN
STATION 041001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200

Figure 89.

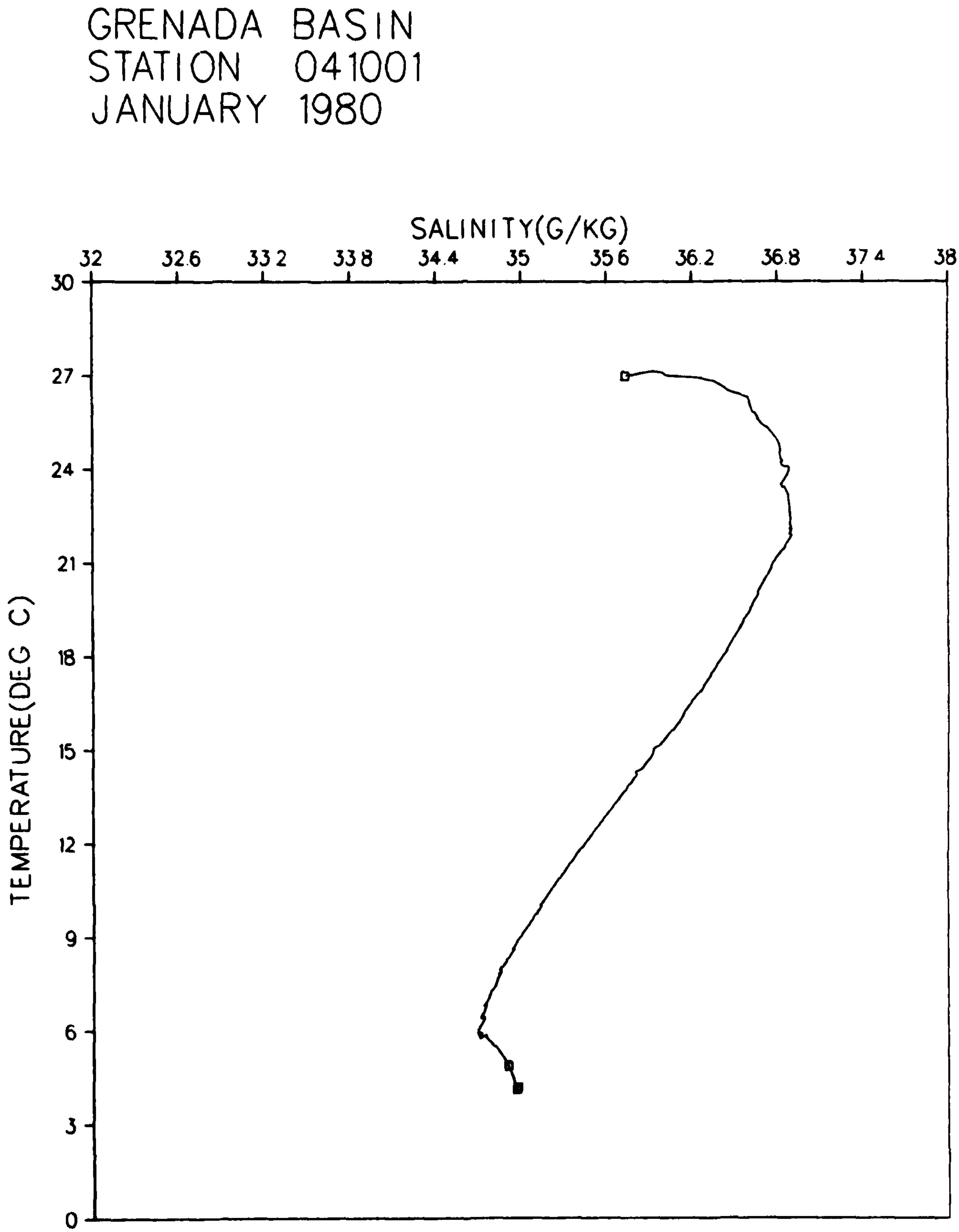

GRENADA BASIN
STATION 041001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
30
27
24
21
18
15
12
9
6
3
0
TEMPERATURE(DEG C)

Figure 90.

GRENADA BASIN
STATION 042001
JANUARY 1980

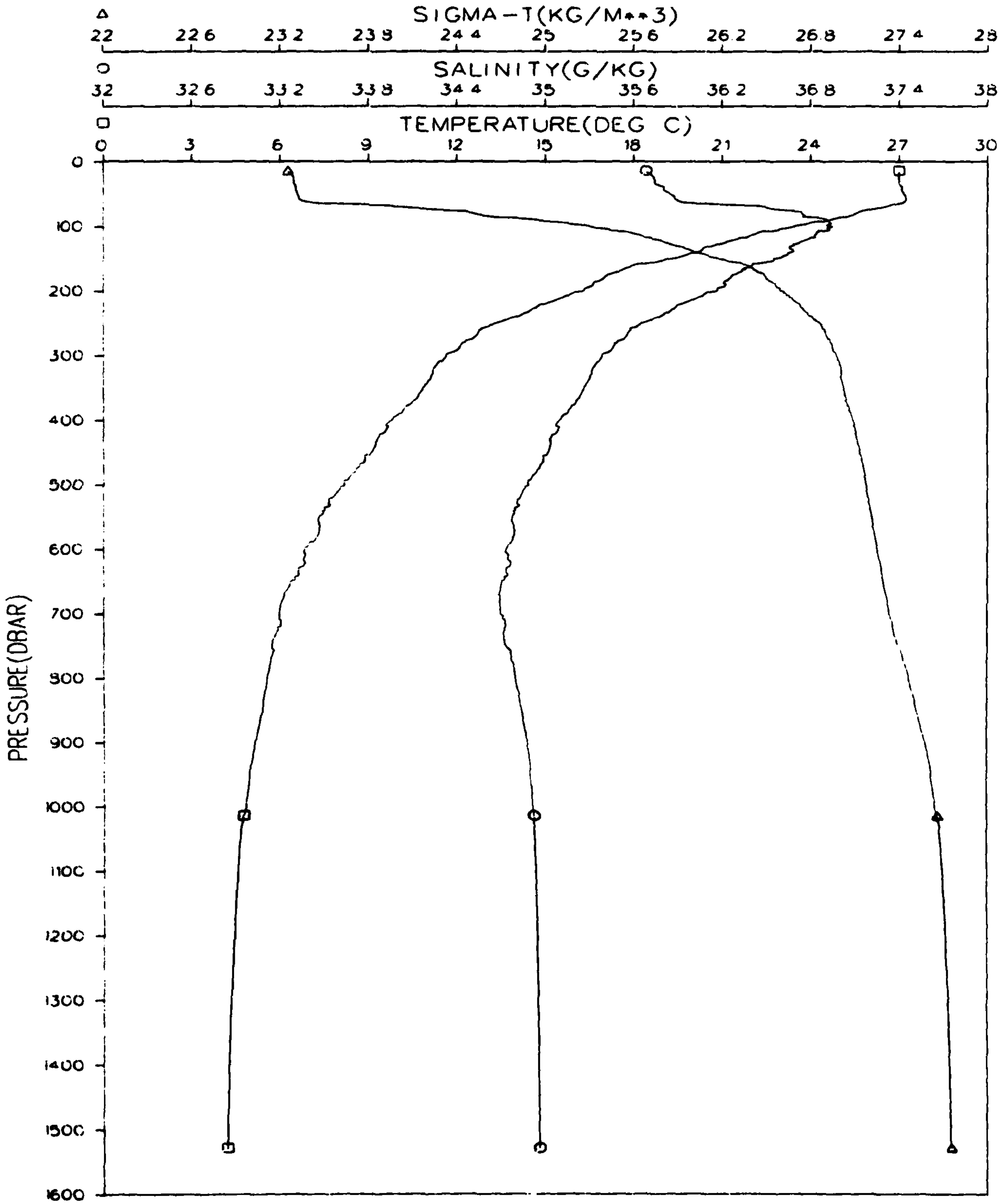


Figure 91.

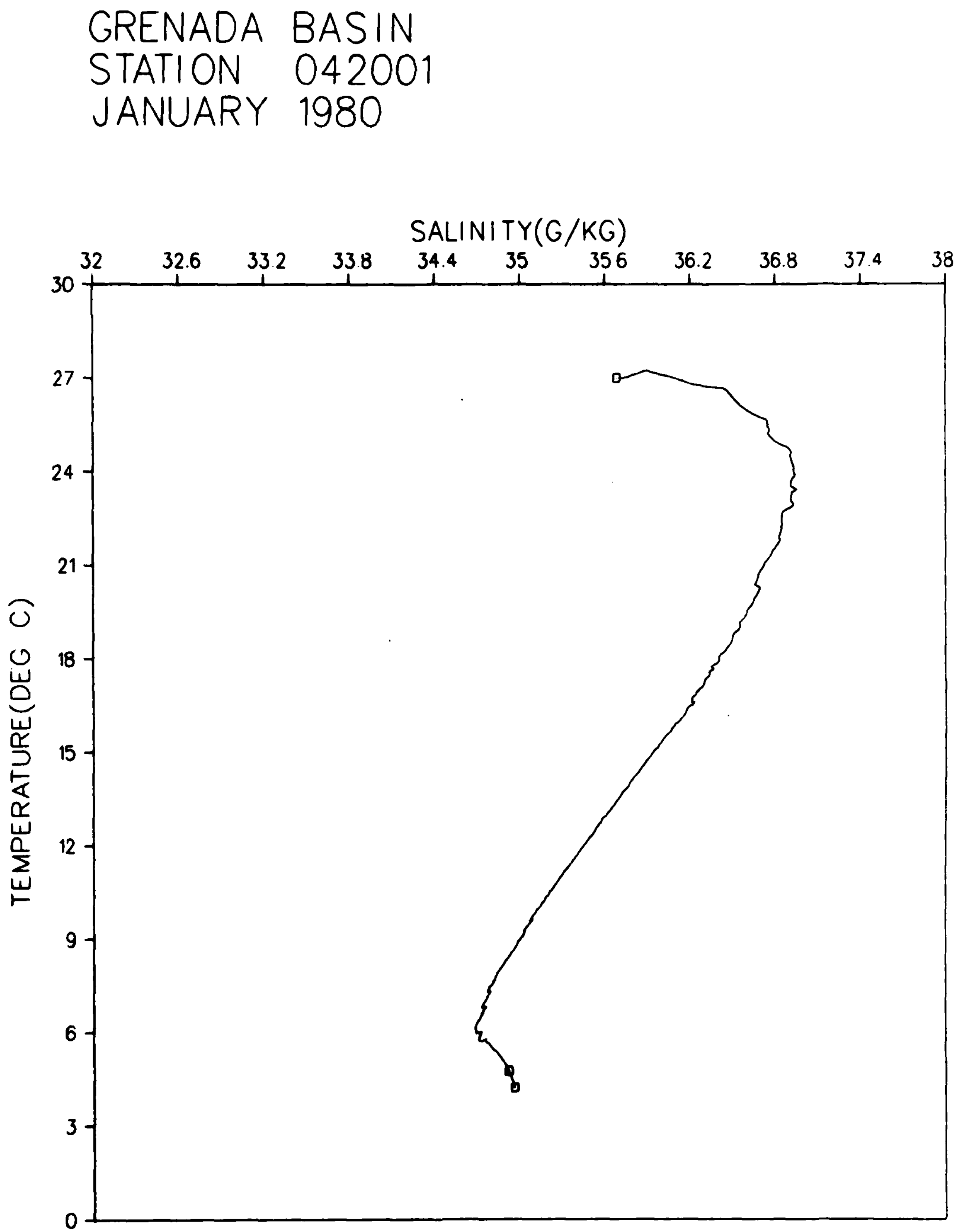

GRENADA BASIN
STATION 042001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 92.

GRENADA BASIN
STATION 043001
JANUARY 1980

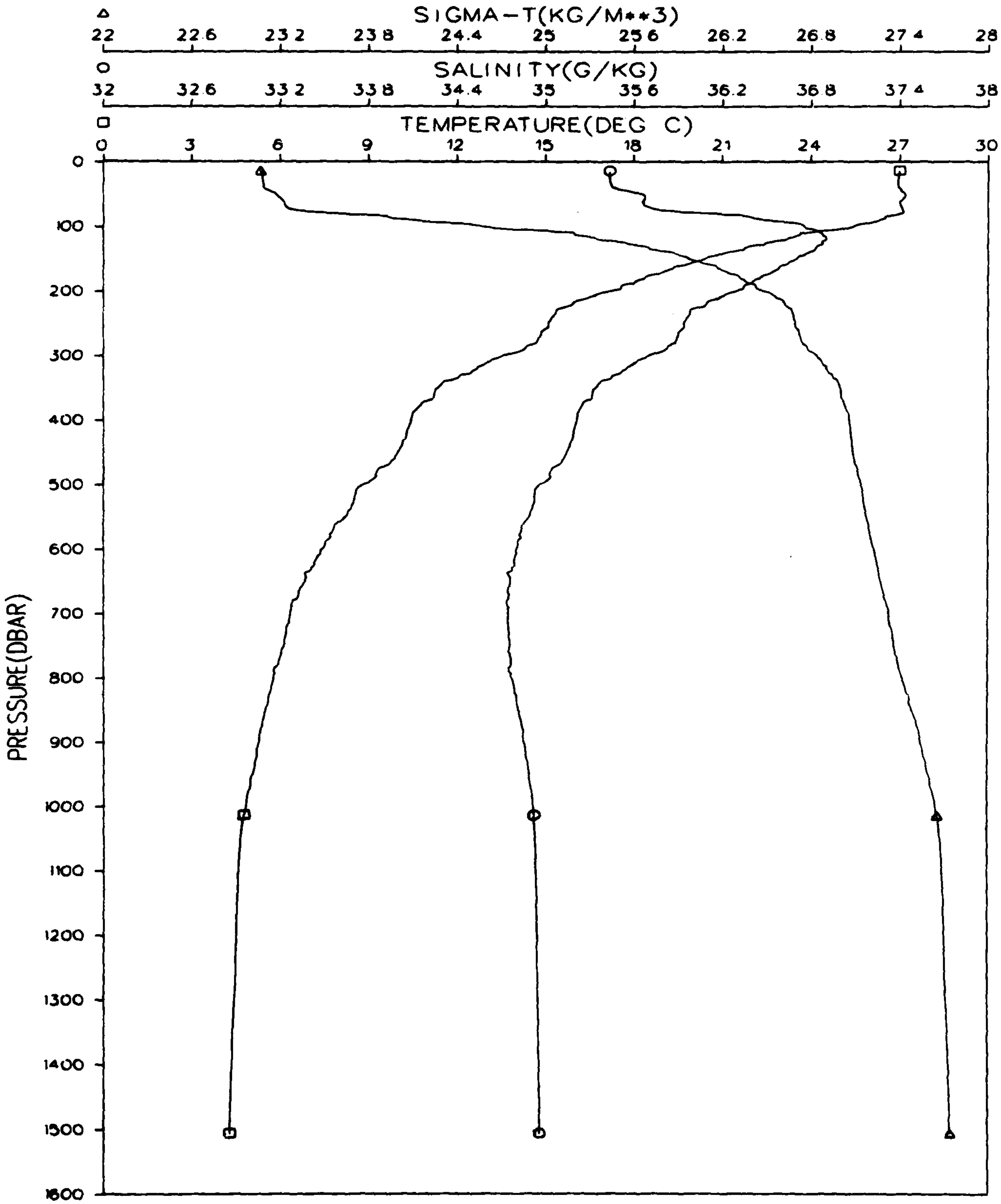


Figure 93.

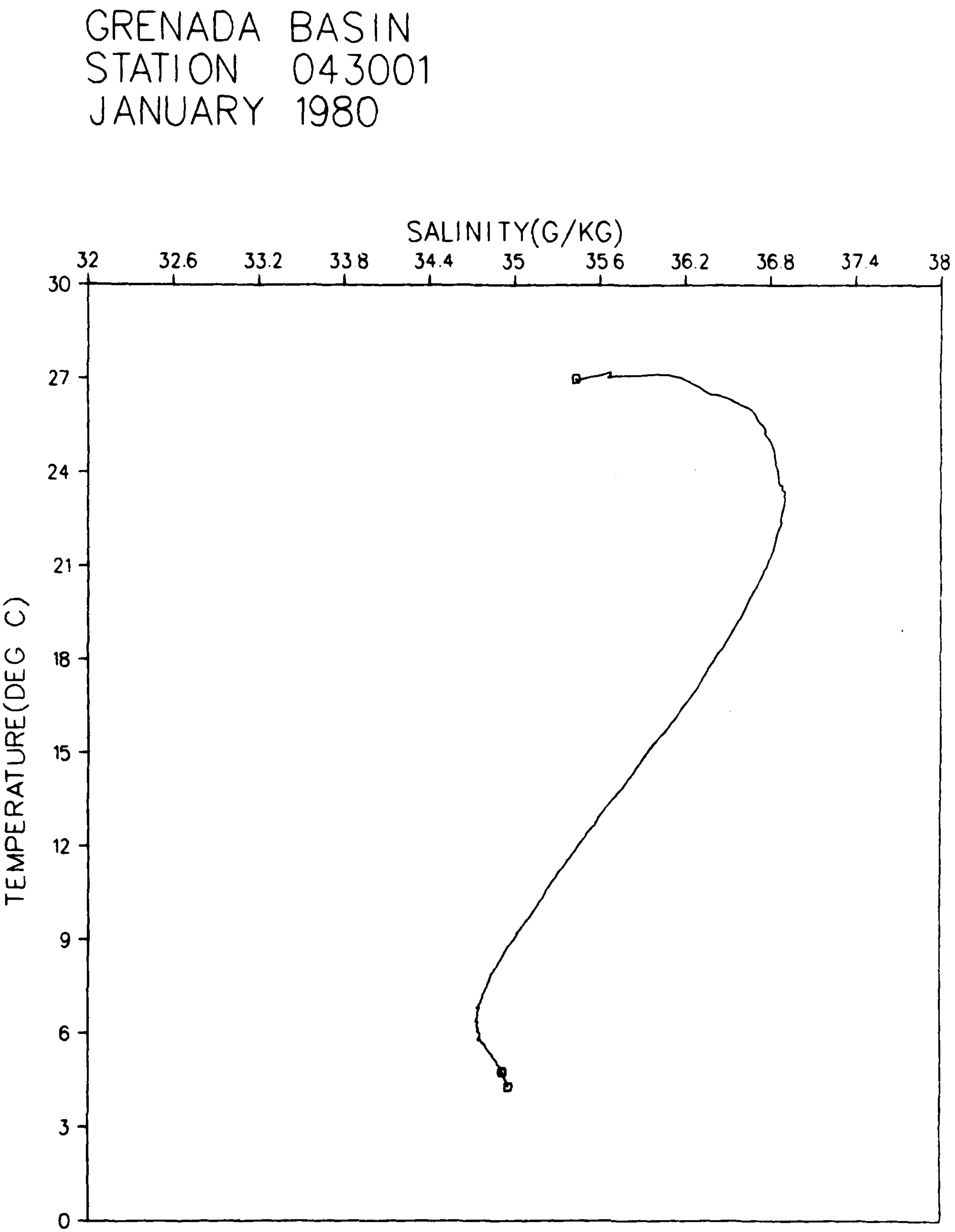

GRENADA BASIN
STATION 043001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 94.

GRENADA BASIN
STATION 044001
JANUARY 1980

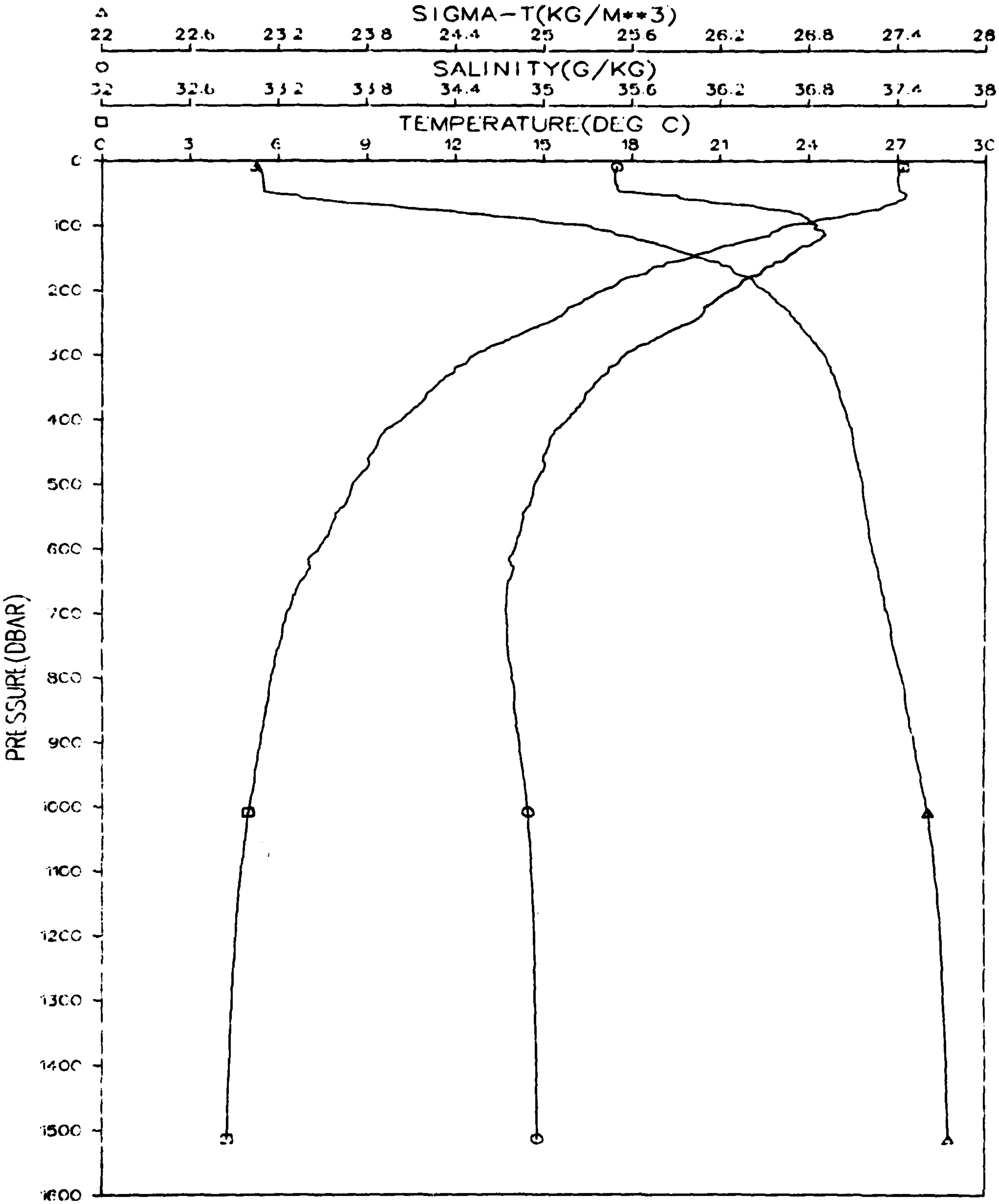


Figure 95.

GRENADA BASIN
STATION 044001
JANUARY 1980

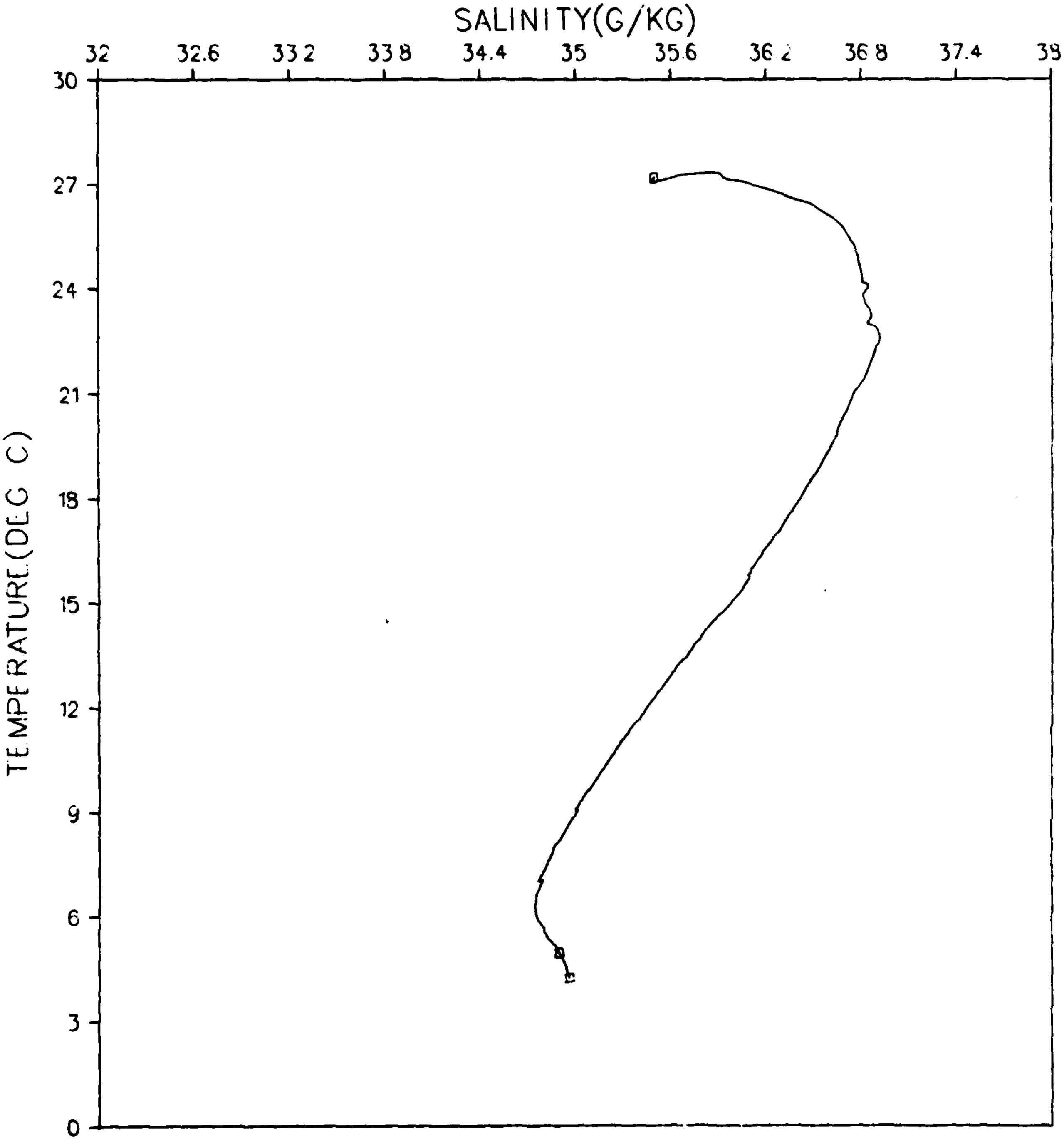


Figure 96.

GRENADA BASIN
STATION 045001
JANUARY 1980

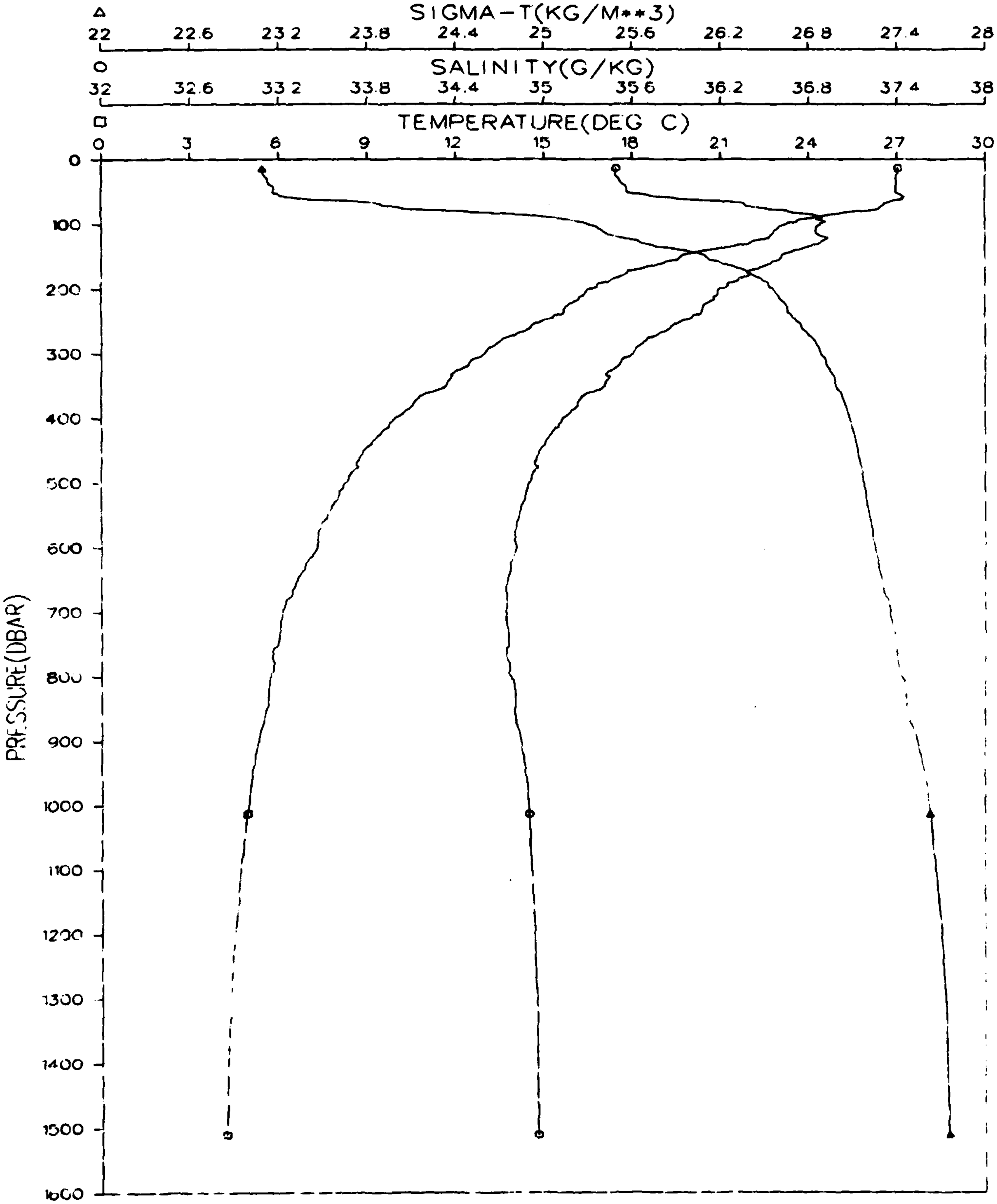


Figure 97.

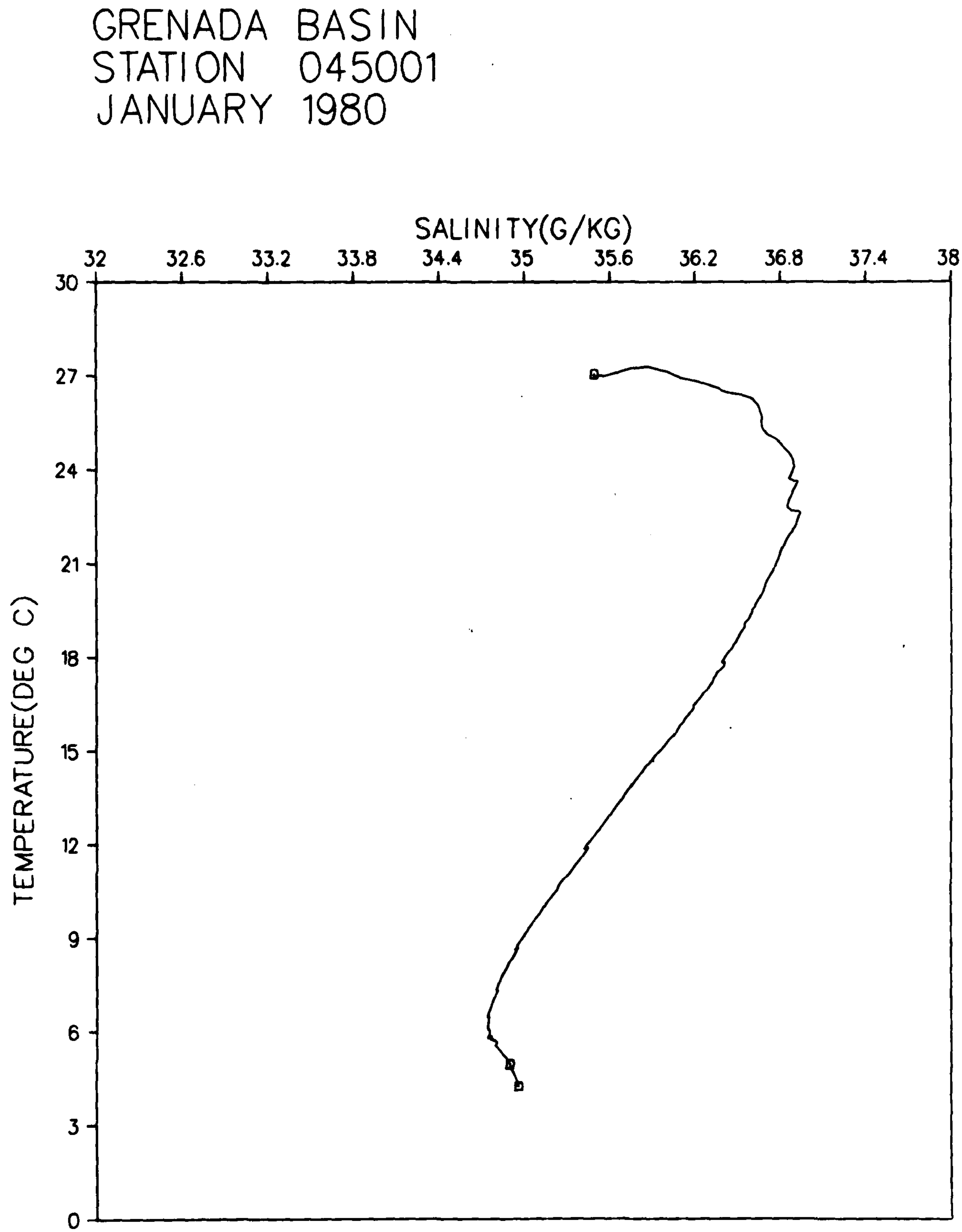

GRENADA BASIN
STATION 045001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 98.

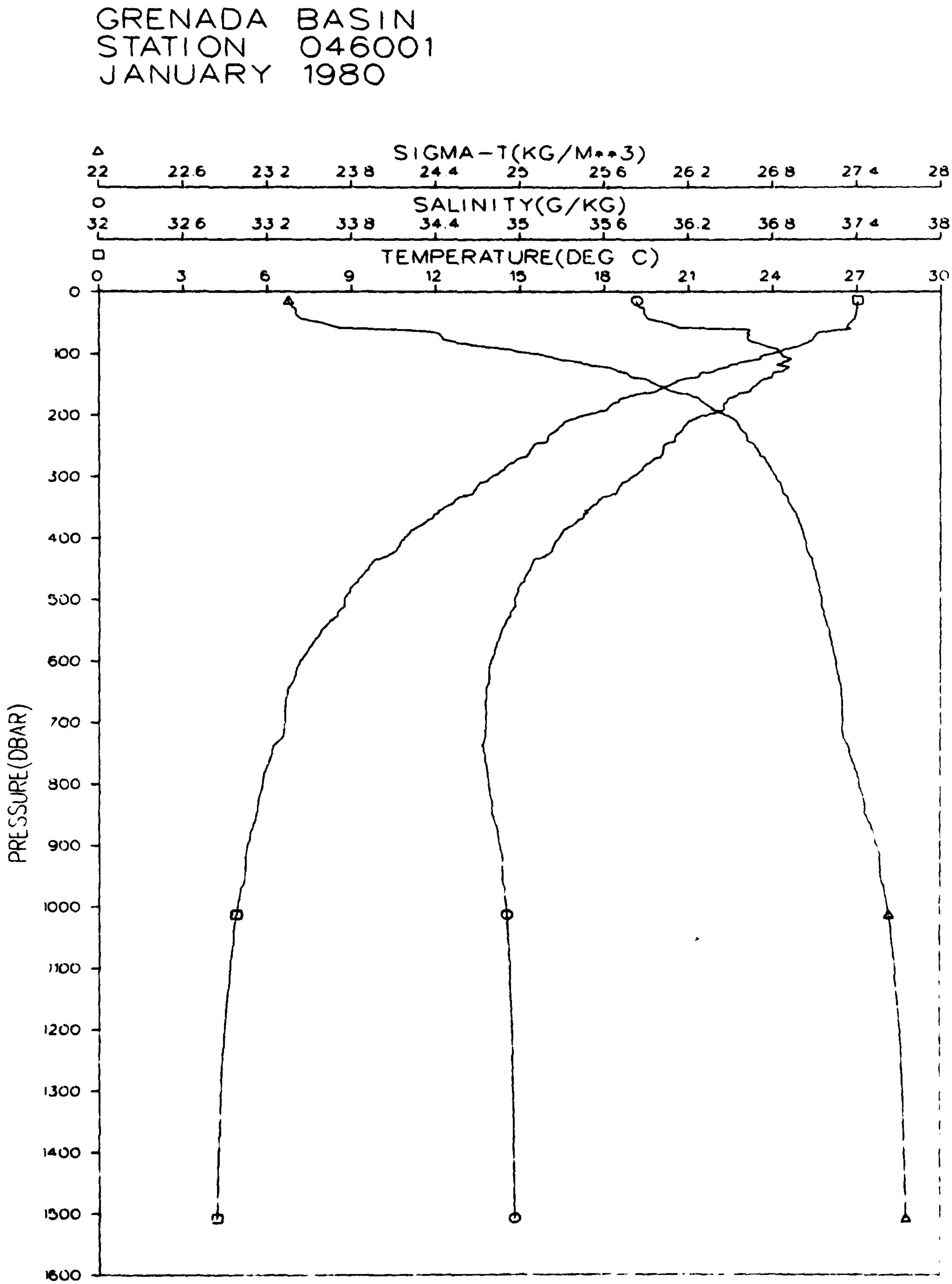

GRENADA BASIN
STATION 046001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 99.

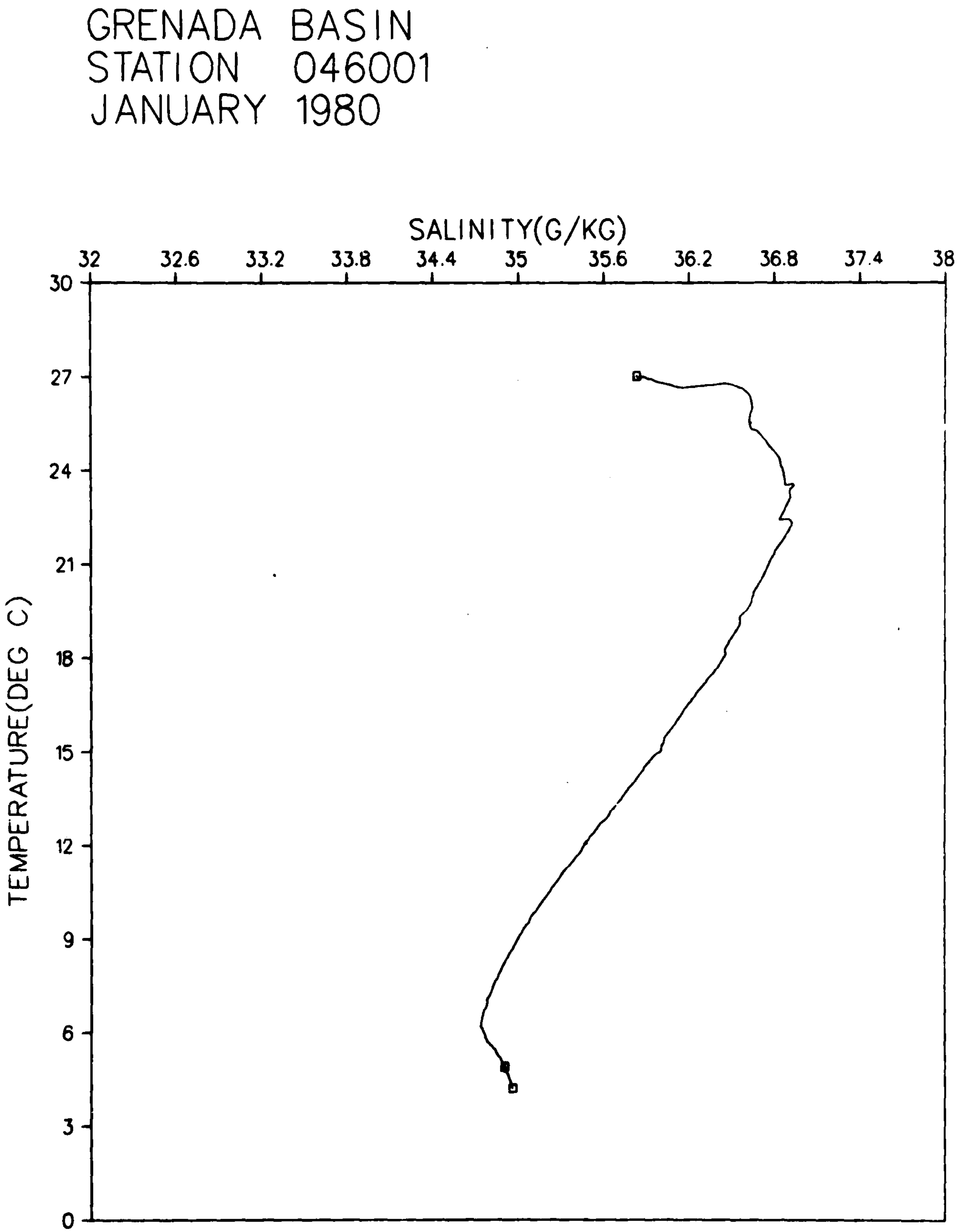

GRENADA BASIN
STATION 046001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 100.

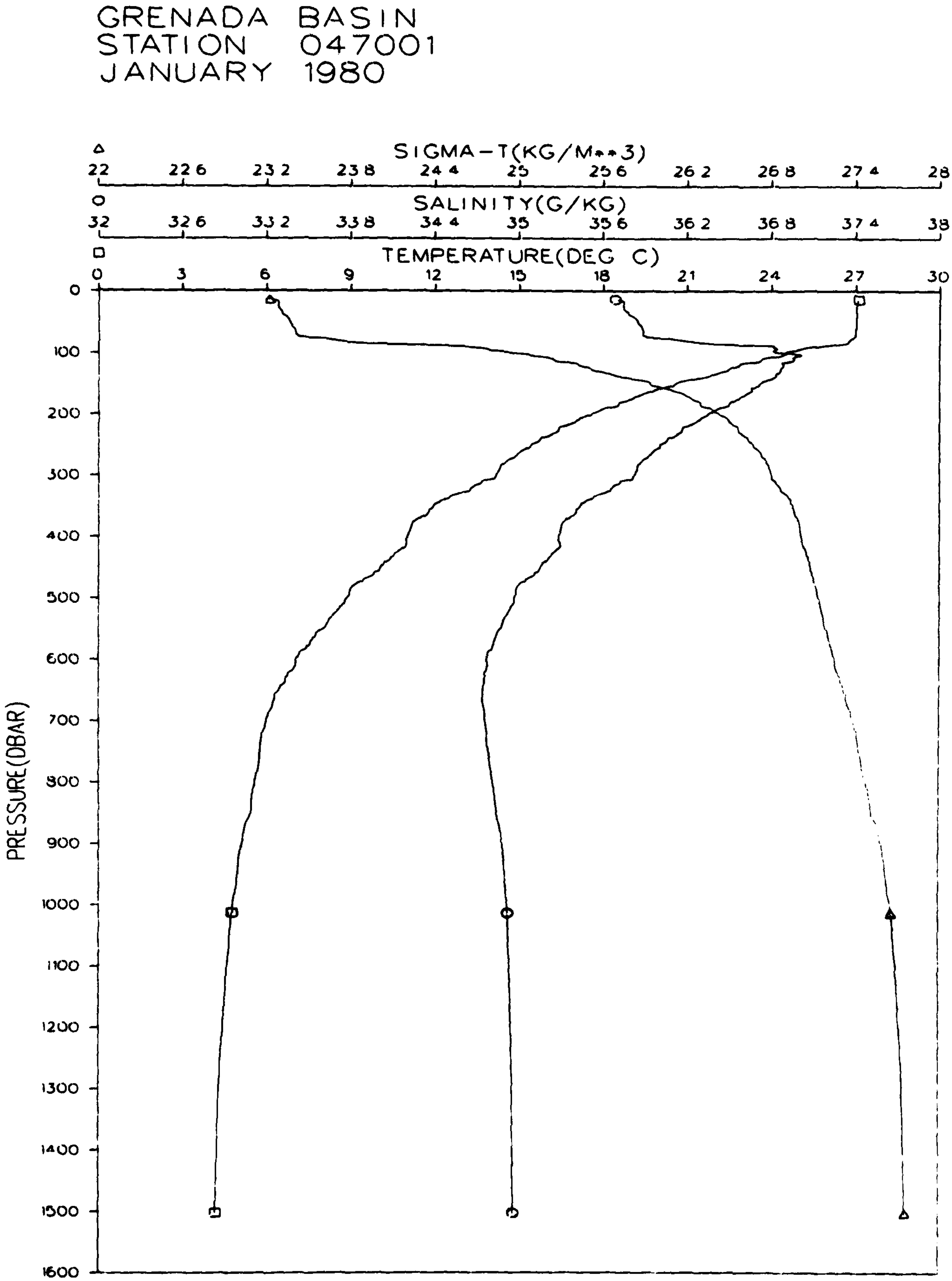
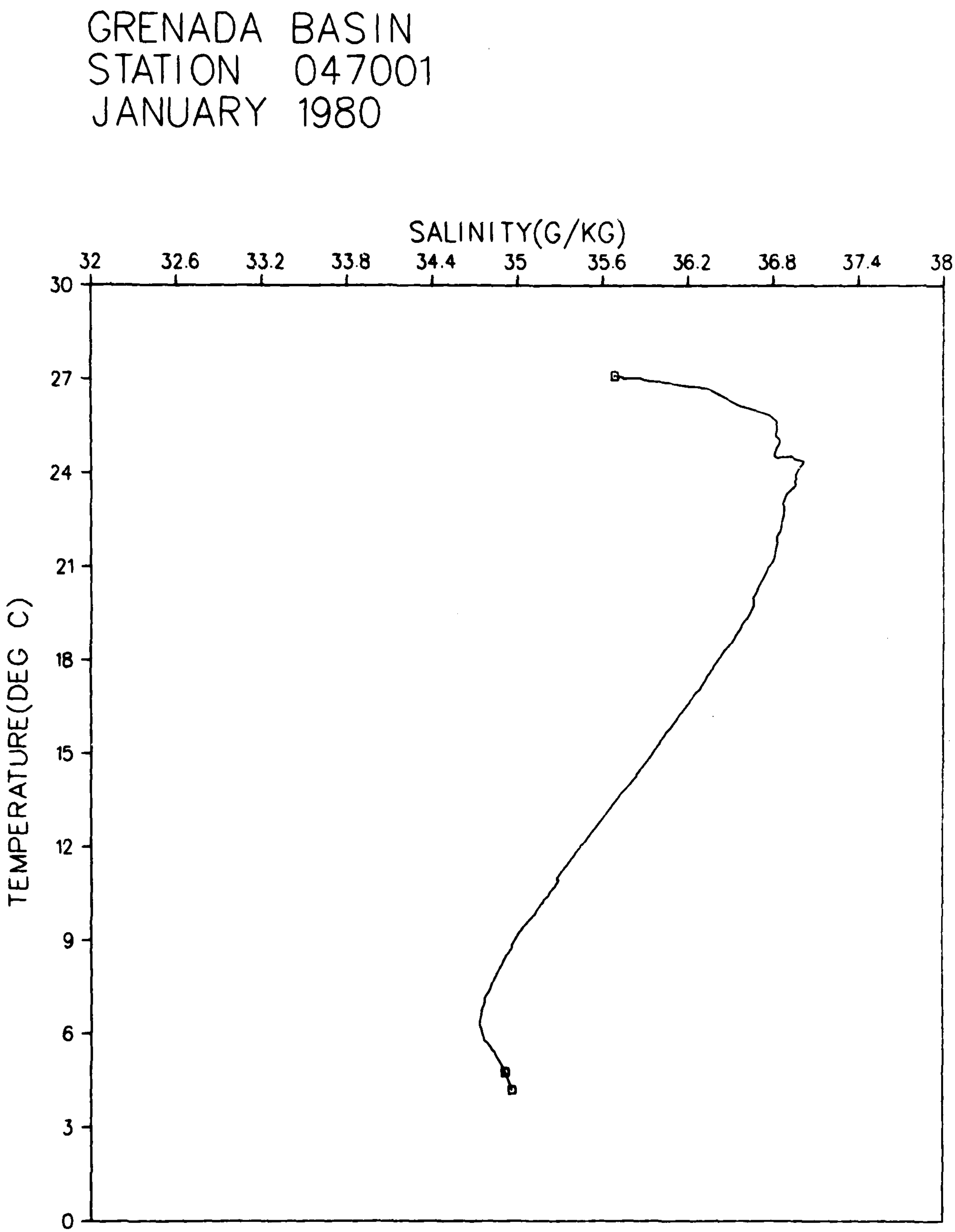
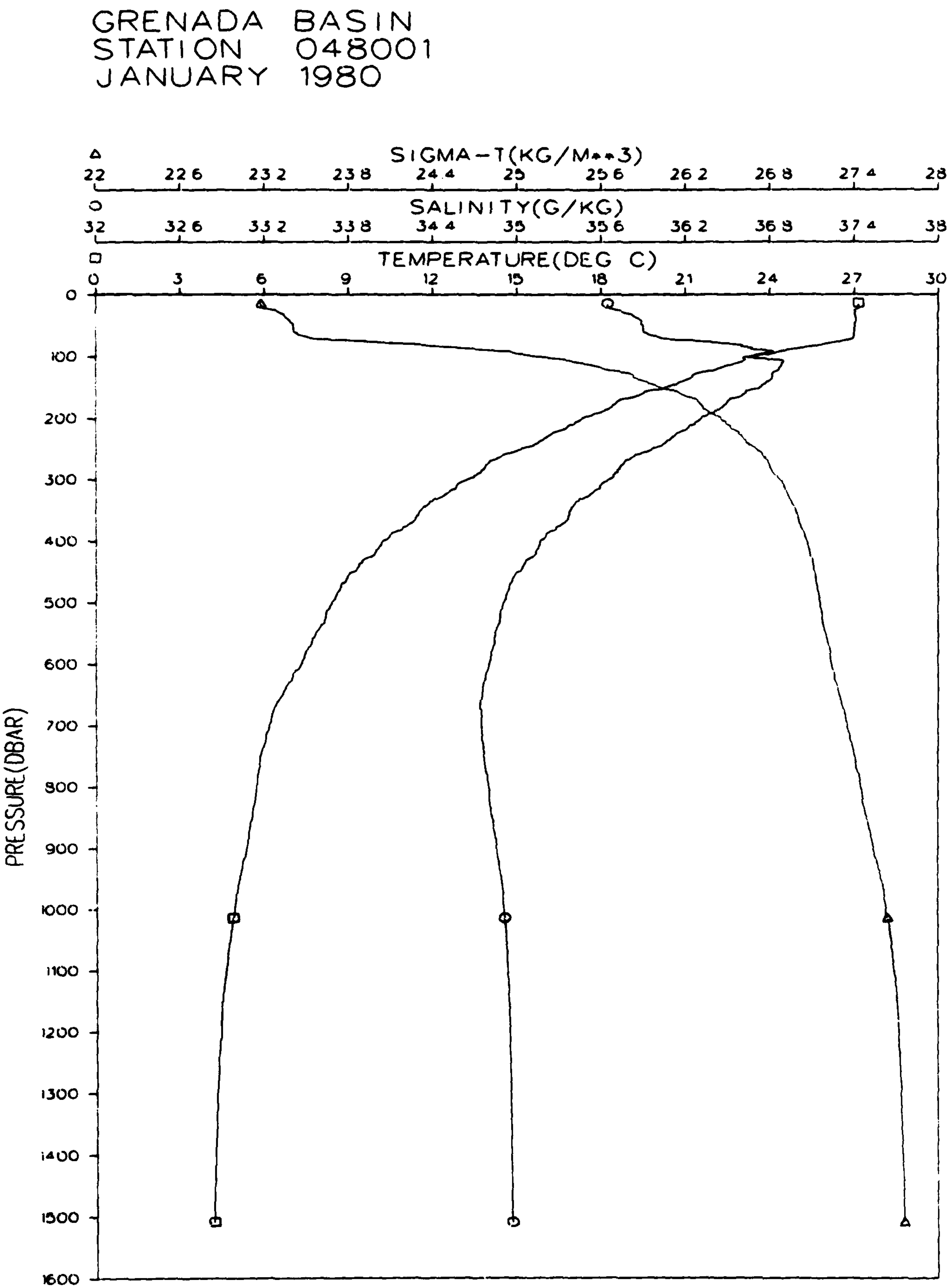

GRENADA BASIN
STATION 047001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22 6
23 2
23 8
24 4
25
25 6
26 2
26 8
27 4
28
SALINITY(G/KG)
32
32 6
33 2
33 8
34 4
35
35 6
36 2
36 8
37 4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 101.



GRENADA BASIN
STATION 047001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 102.



GRENADA BASIN
STATION 048001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 103.

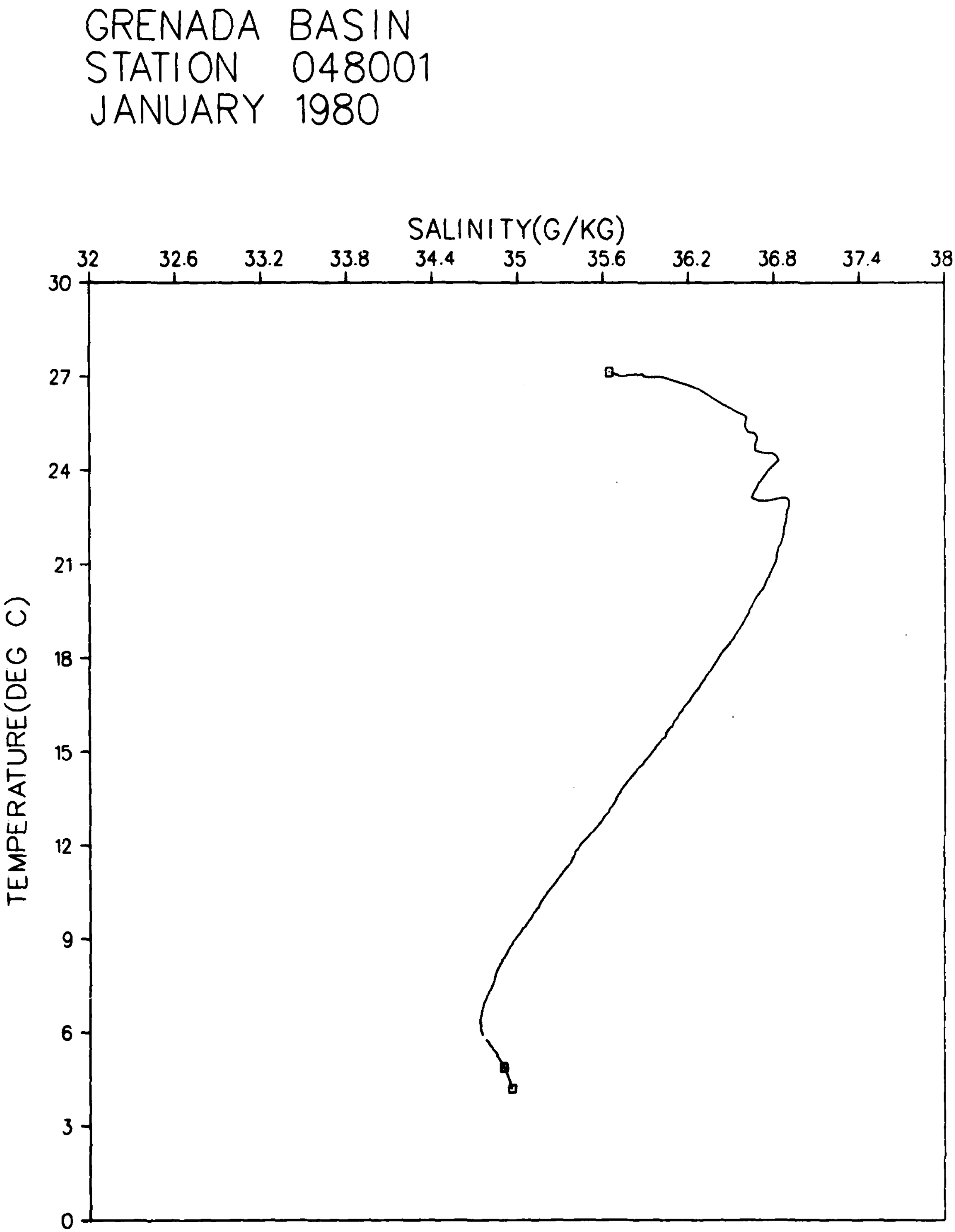

GRENADA BASIN
STATION 048001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 104.

GRENADA BASIN
STATION 049001
JANUARY 1980

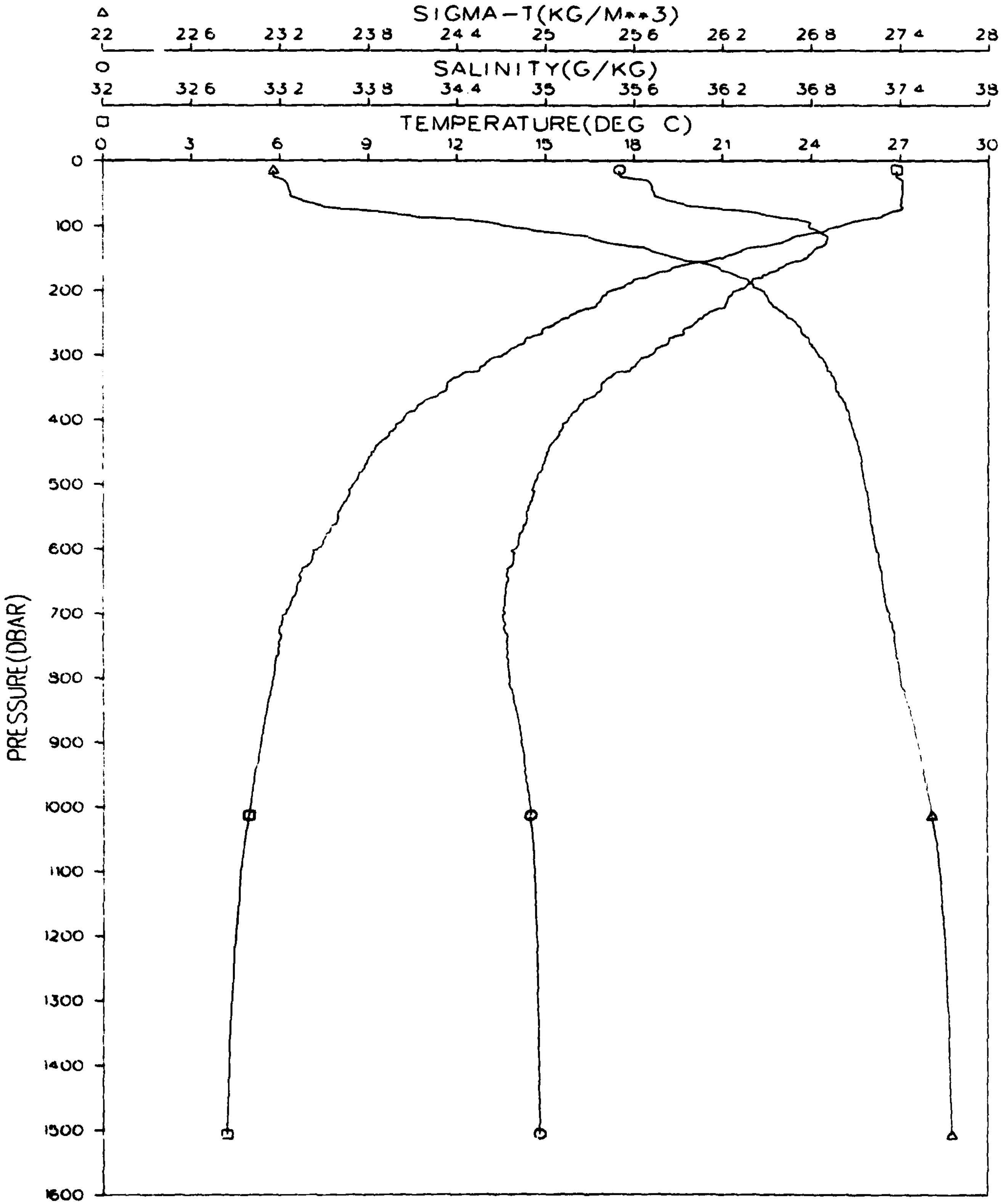
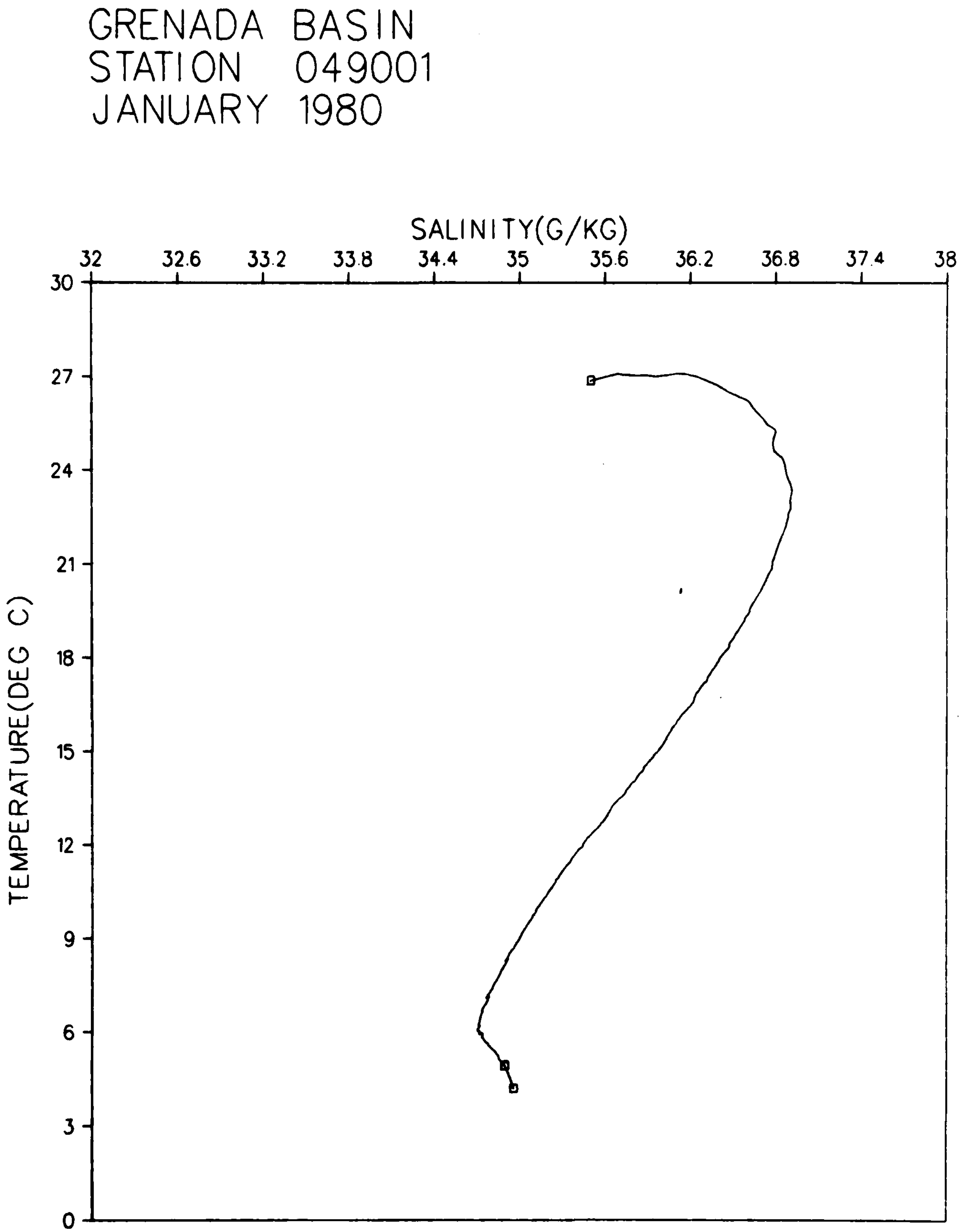


Figure 105.



GRENADA BASIN
STATION 049001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 106.

GRENADA BASIN
STATION 050001
JANUARY 1980

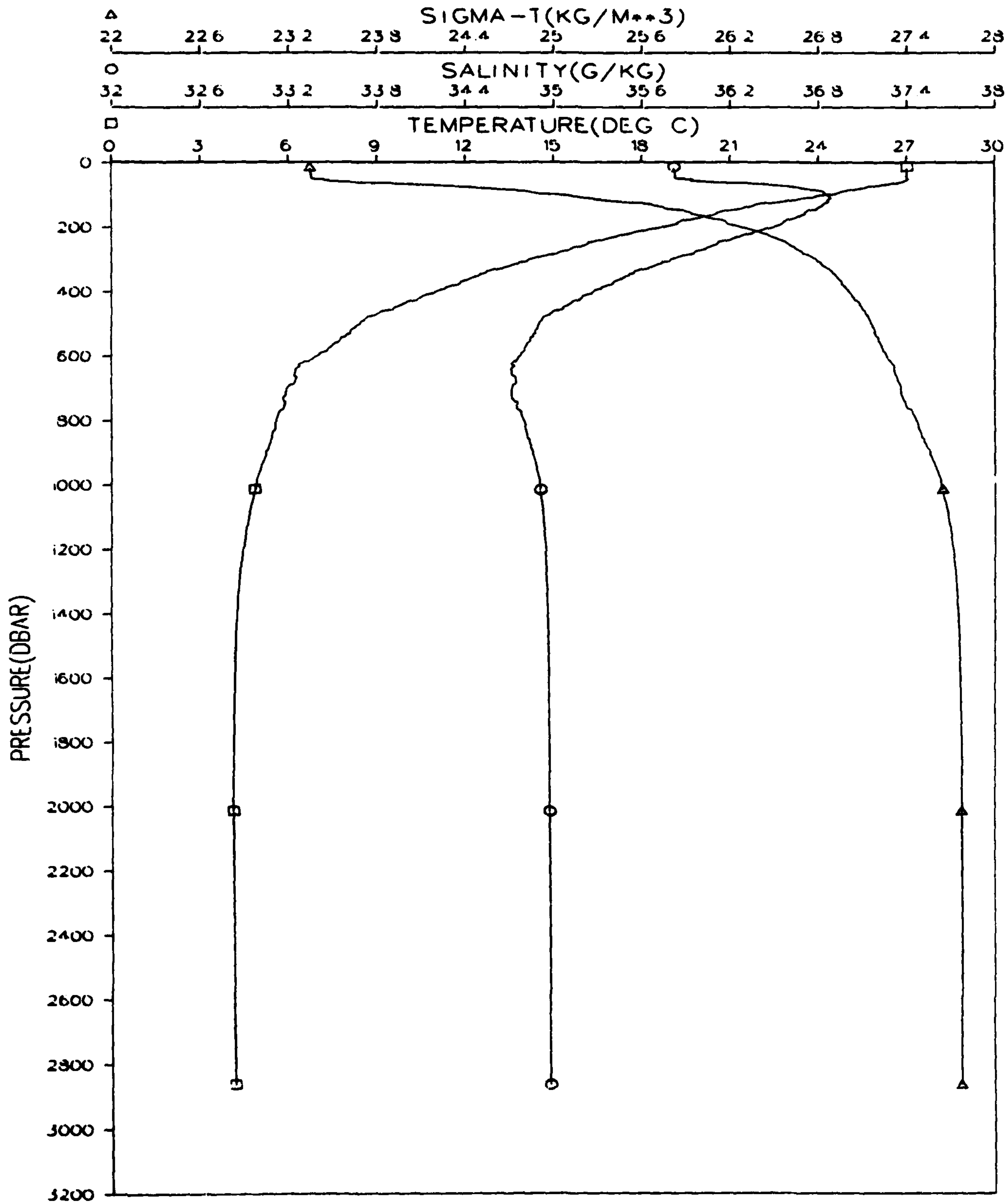


Figure 107.

GRENADA BASIN
STATION 050001
JANUARY 1980

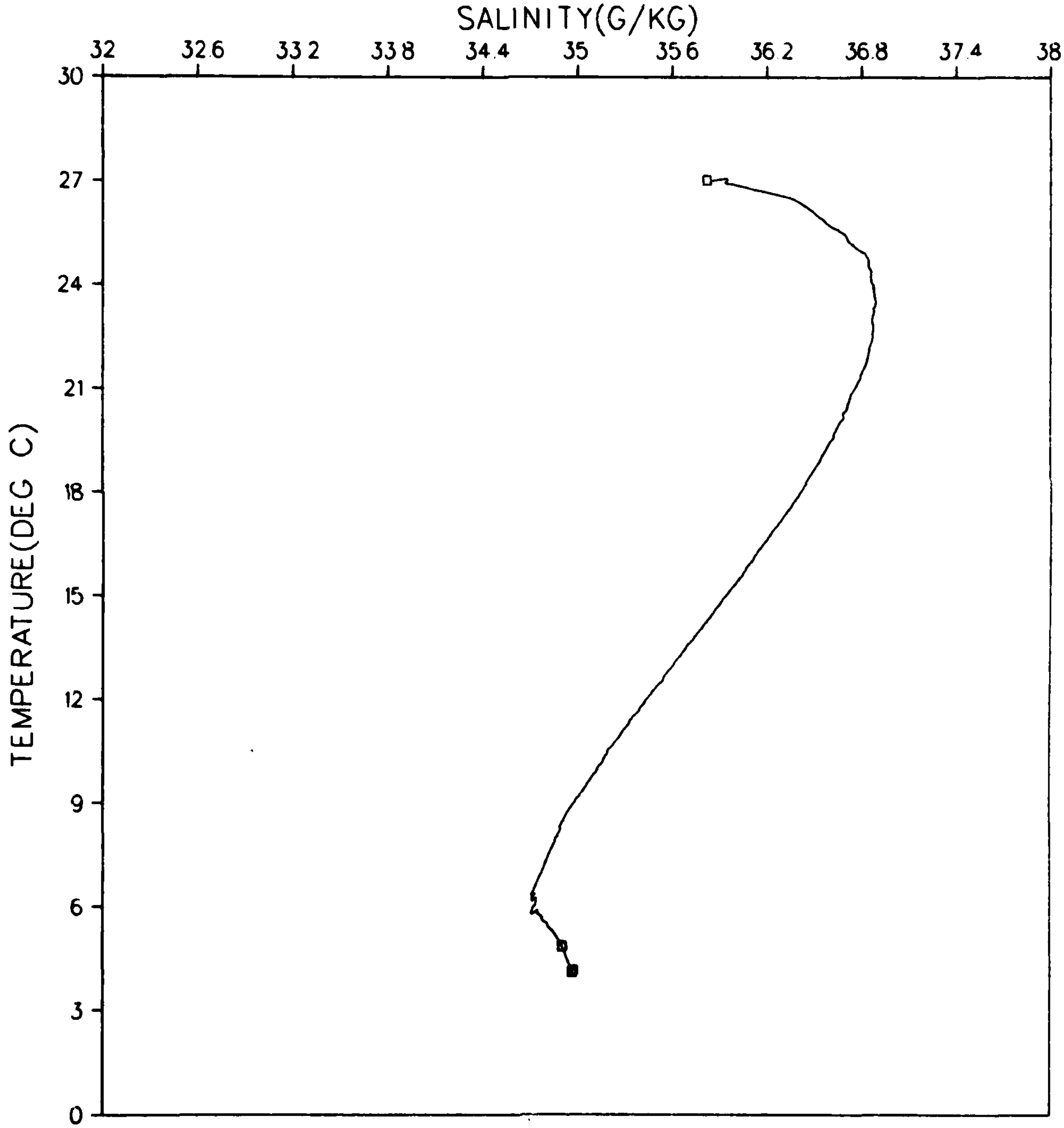


Figure 108.

GRENADA BASIN
STATION 051001
JANUARY 1980

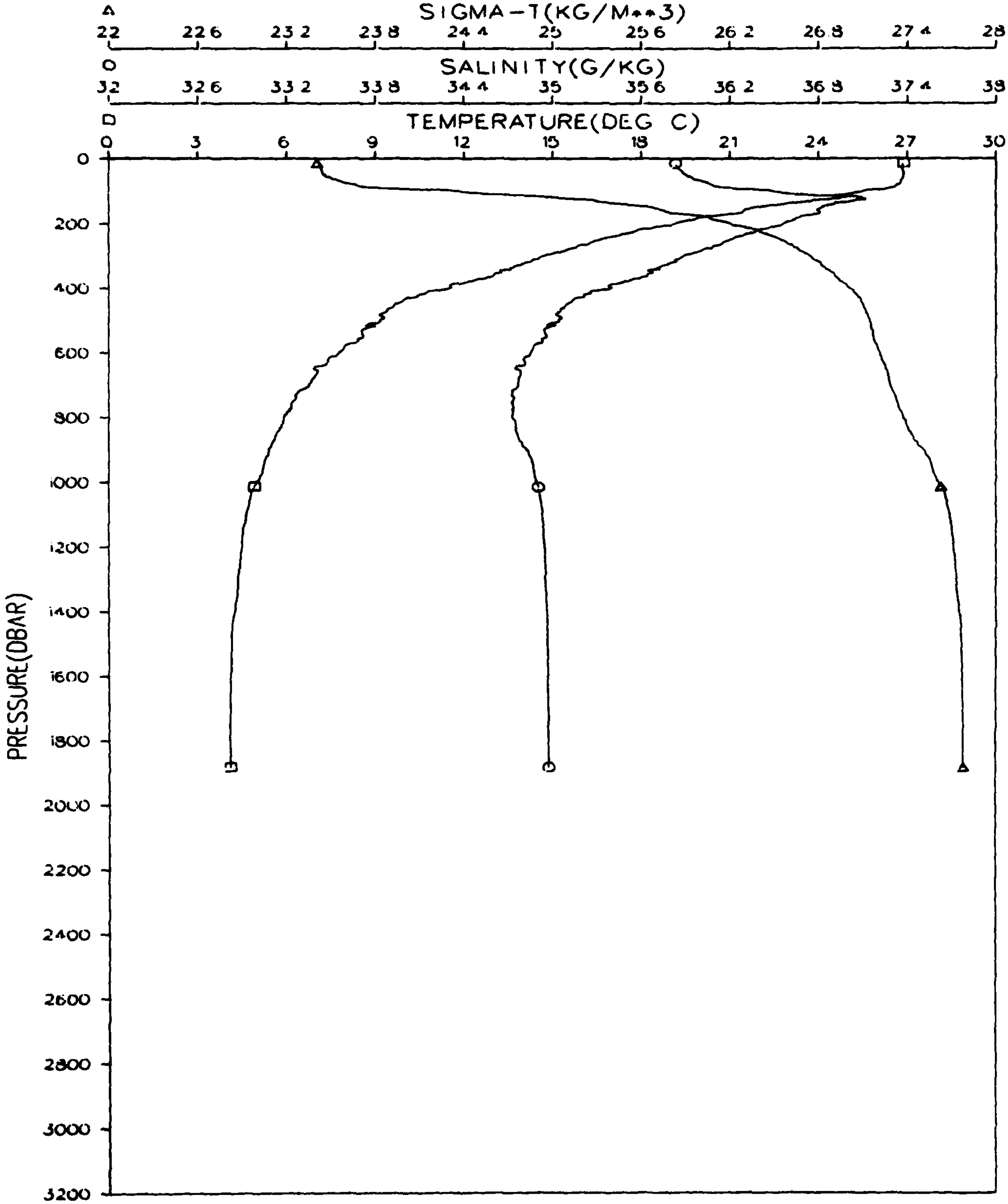


Figure 109.

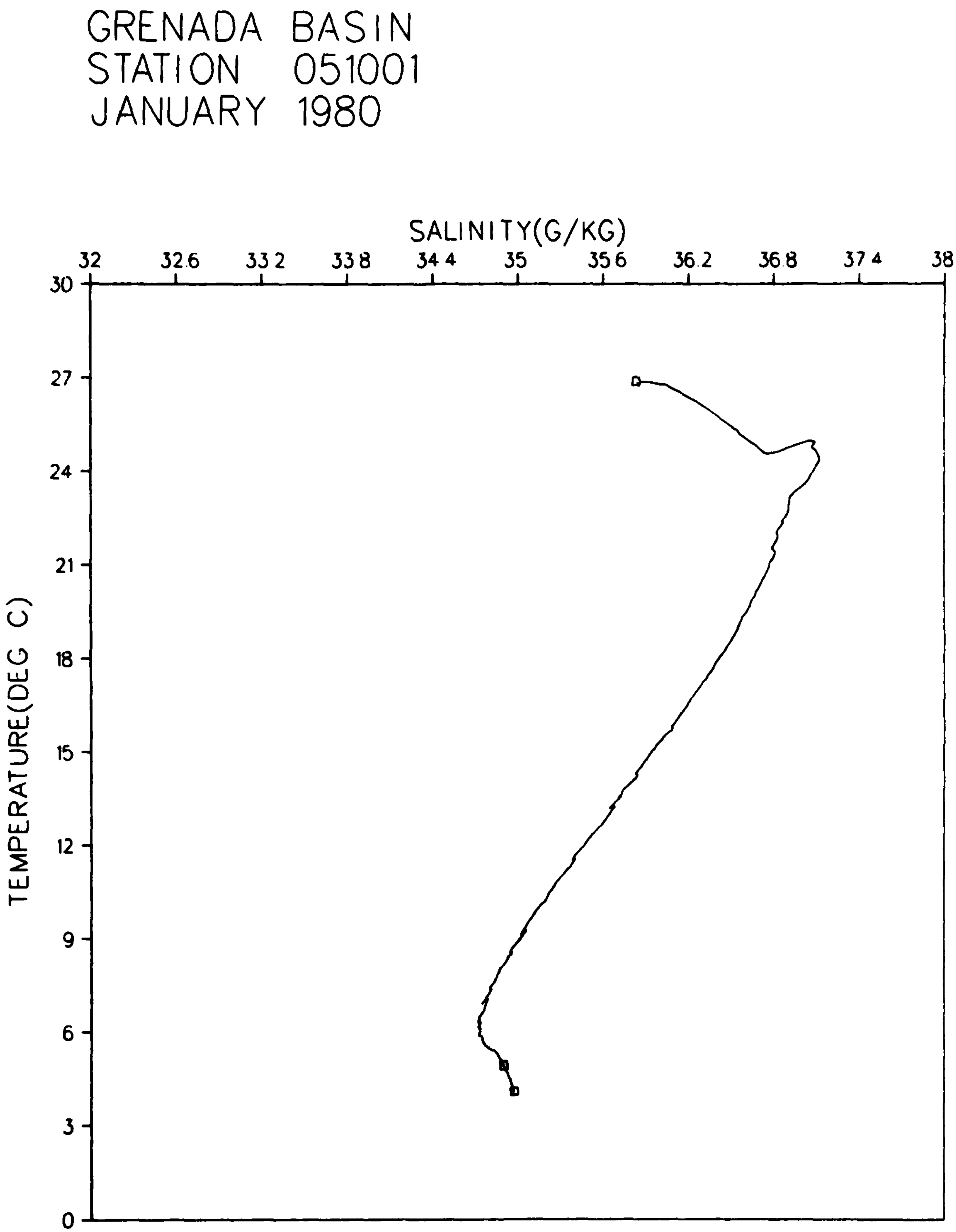

GRENADA BASIN
STATION 051001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 110.

GRENADA BASIN
STATION 052001
JANUARY 1980

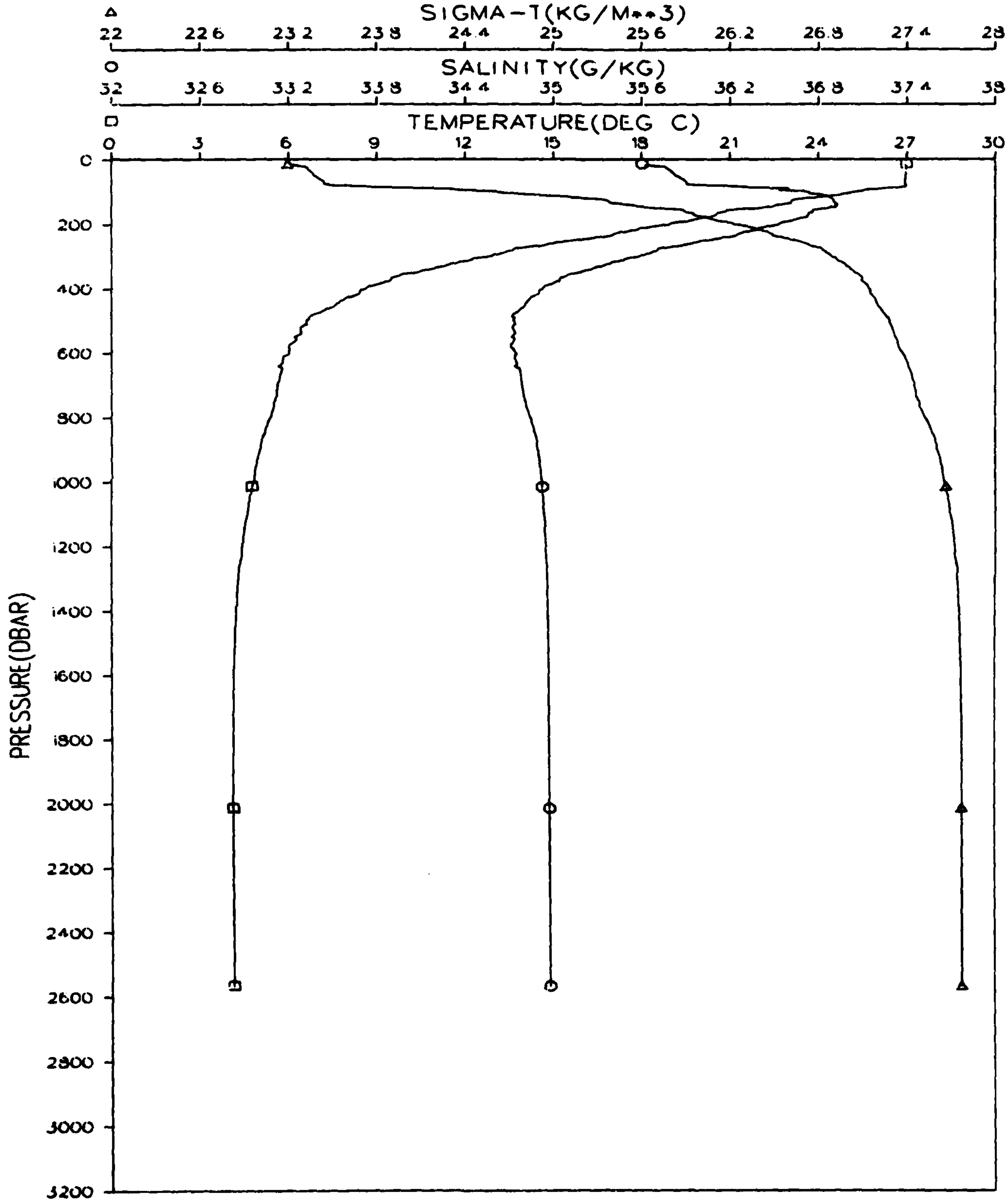


Figure 111.

GRENADA BASIN
STATION 052001
JANUARY 1980

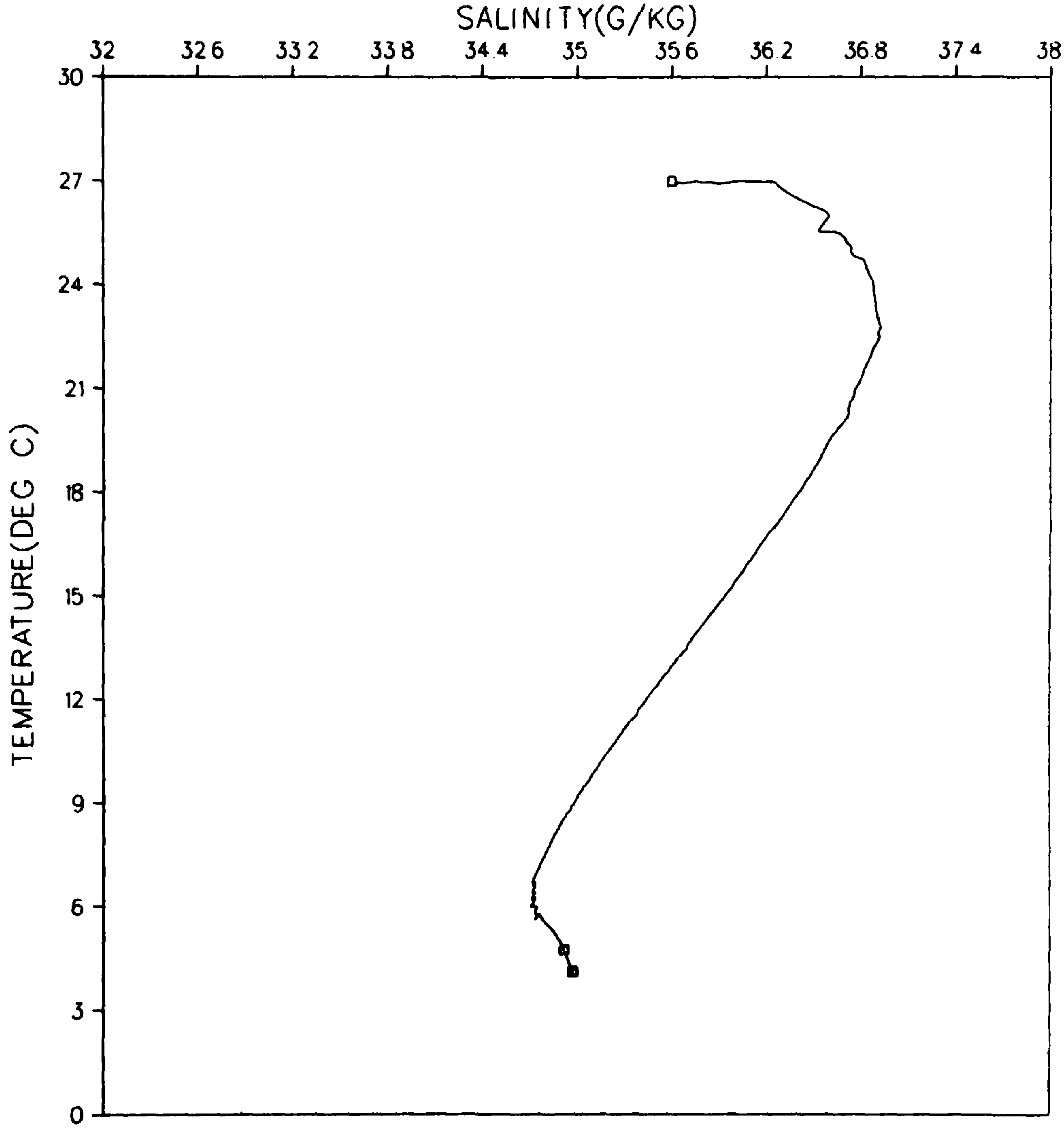


Figure 112.

GRENADA BASIN
STATION 053001
JANUARY 1980

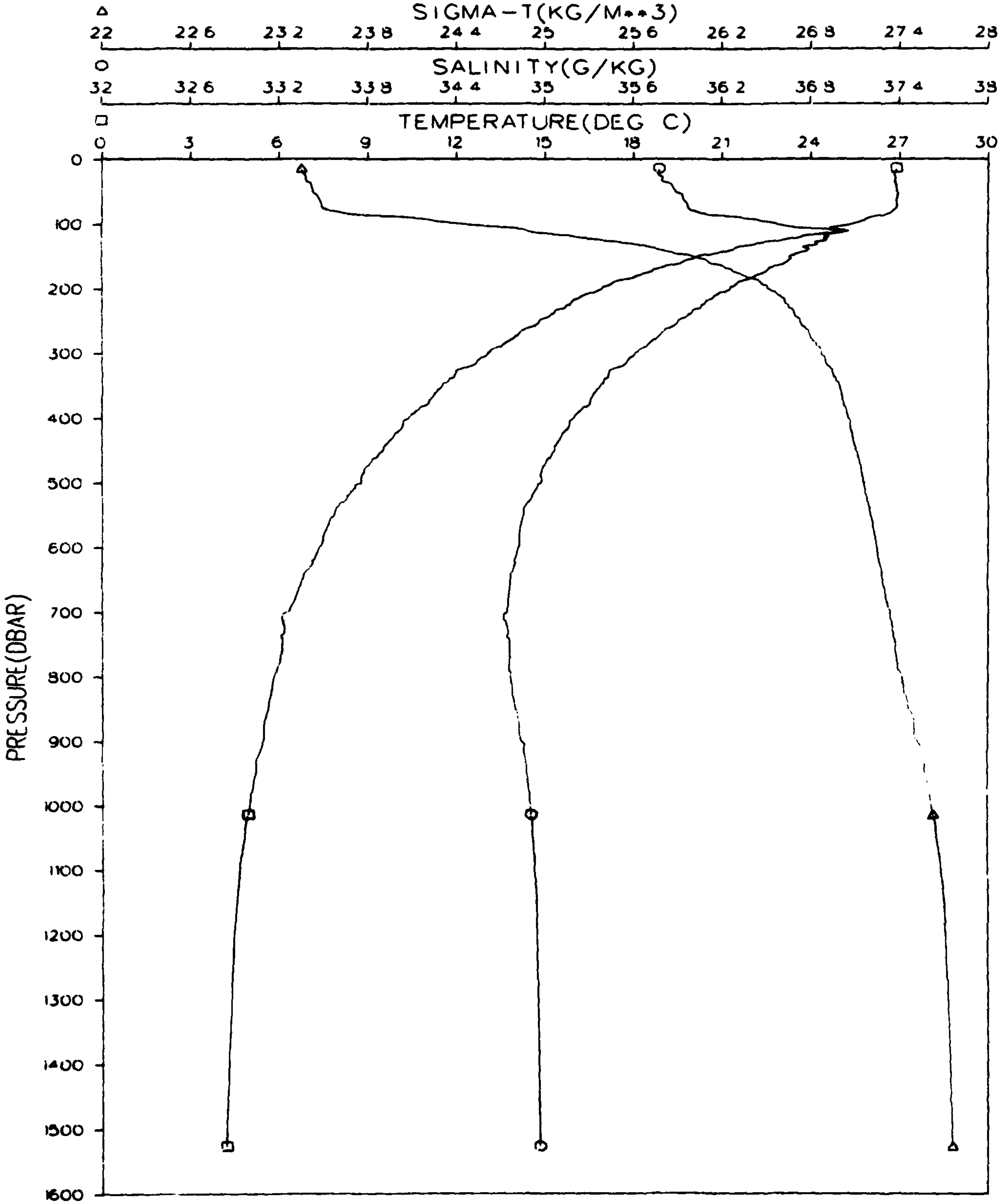


Figure 113.

GRENADA BASIN
STATION 053001
JANUARY 1980

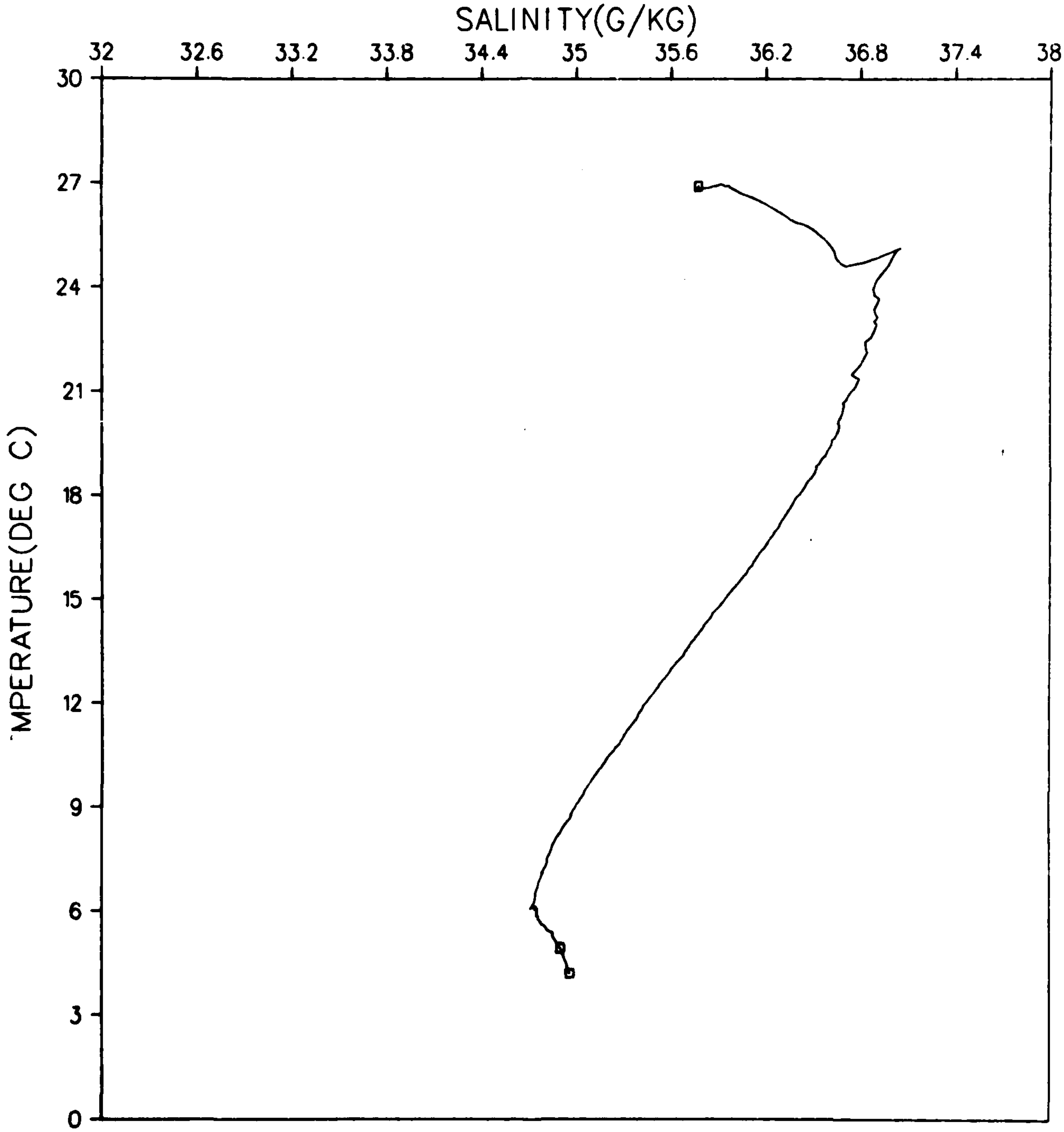


Figure 114.

GRENADA BASIN
STATION 054001
JANUARY 1980

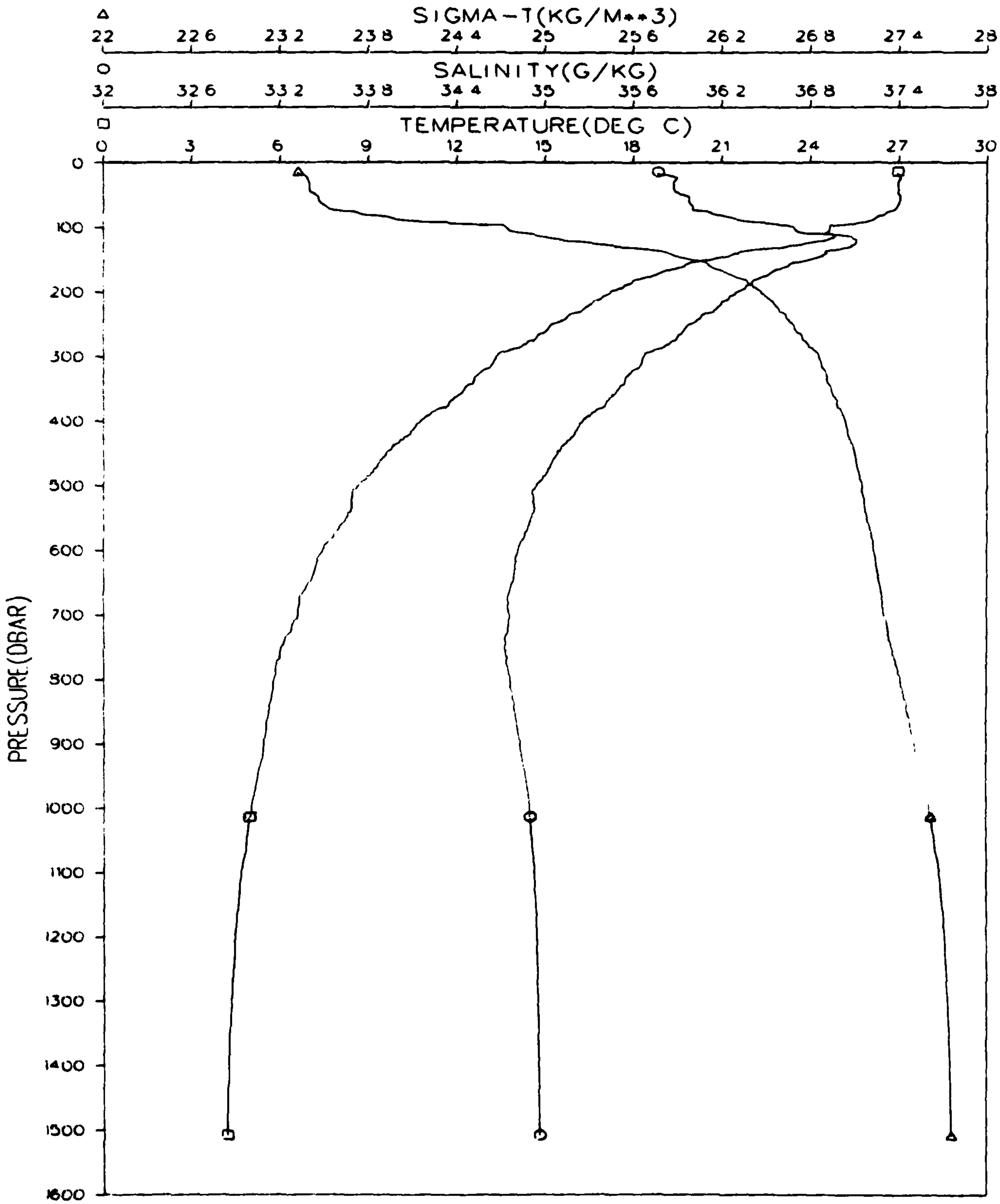


Figure 115.

GRENADA BASIN
STATION 054001
JANUARY 1980

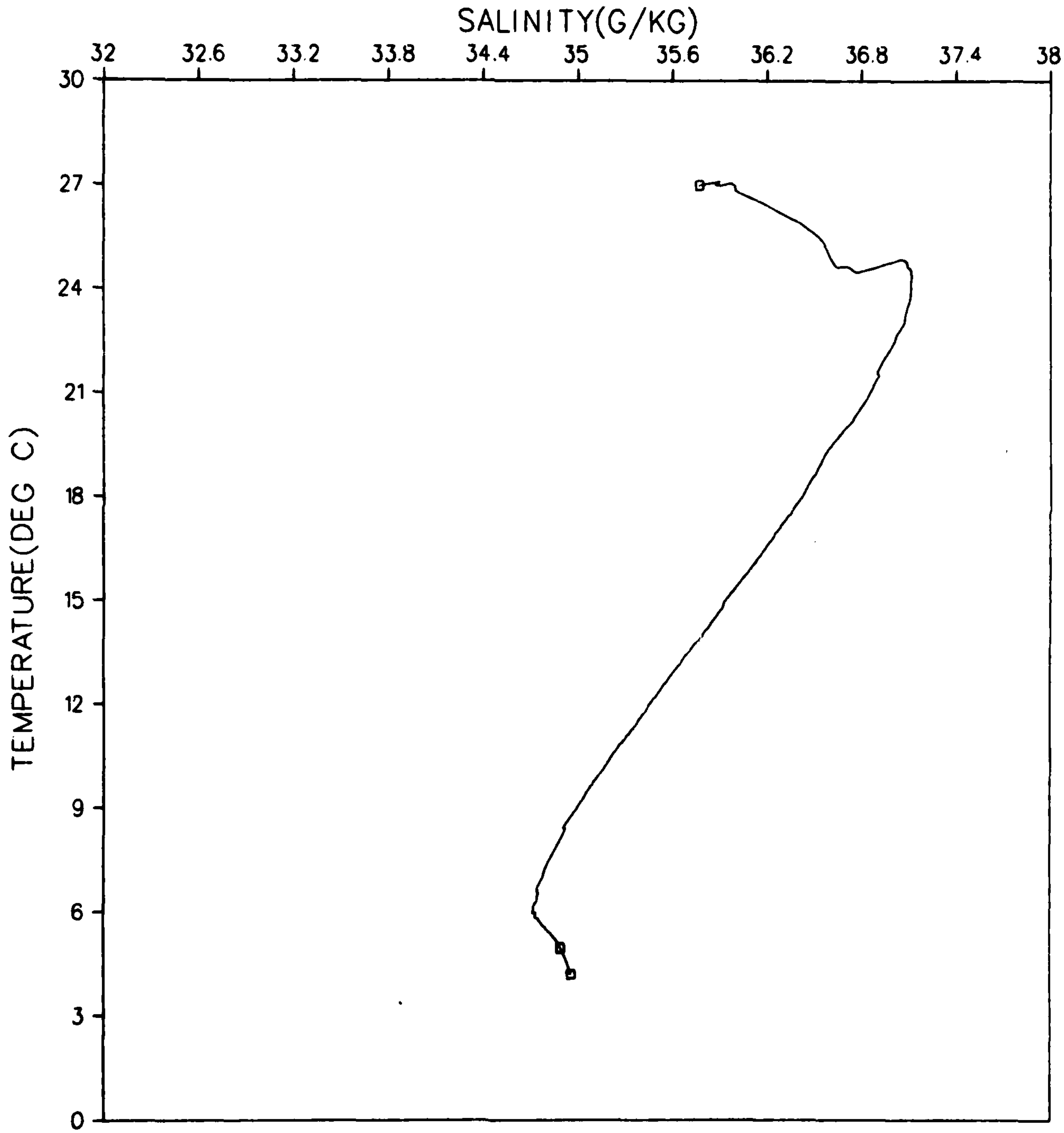


Figure 116.

GRENADA BASIN
STATION 055001
JANUARY 1980

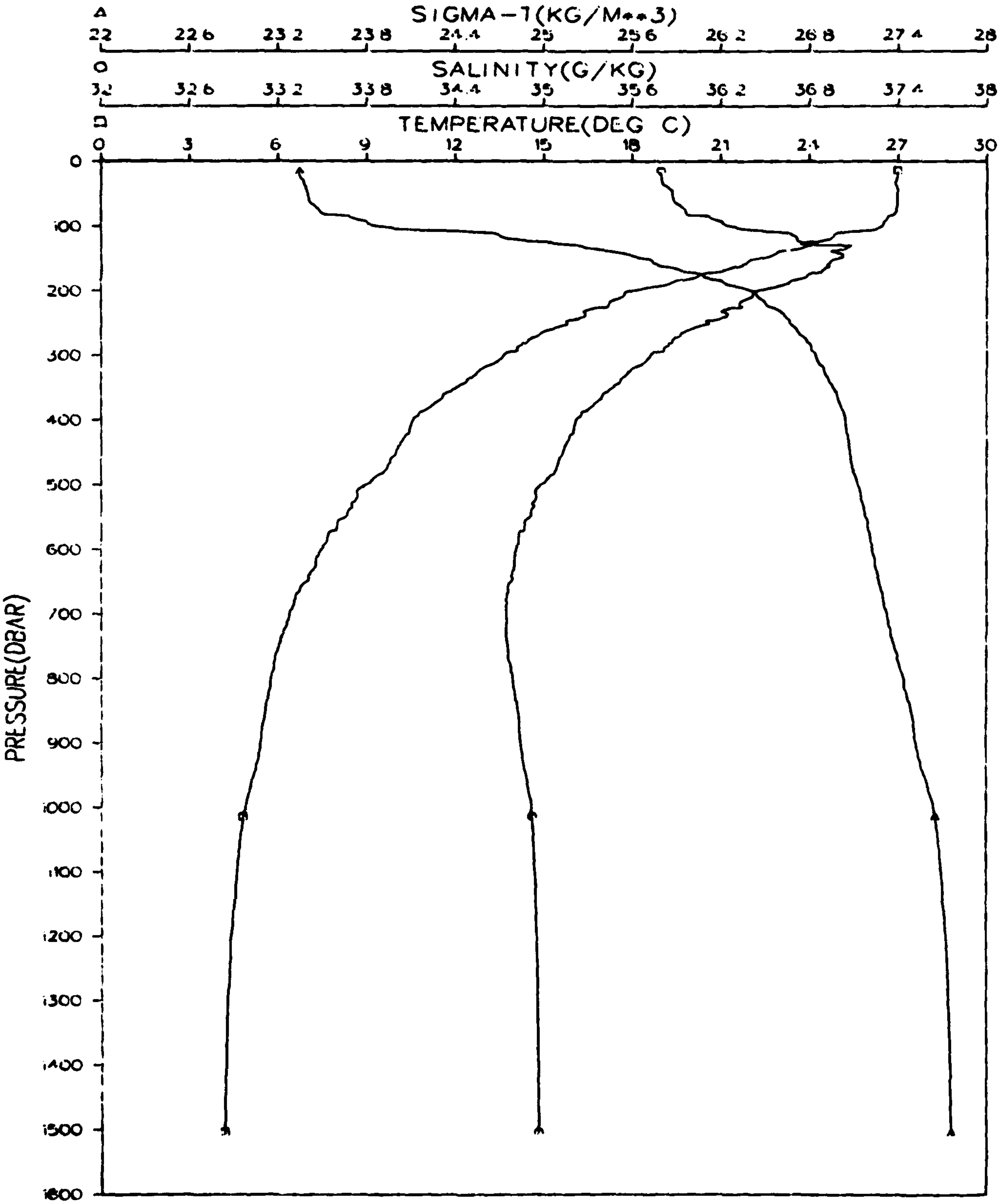


Figure 117.

GRENADA BASIN
STATION 055001
JANUARY 1980

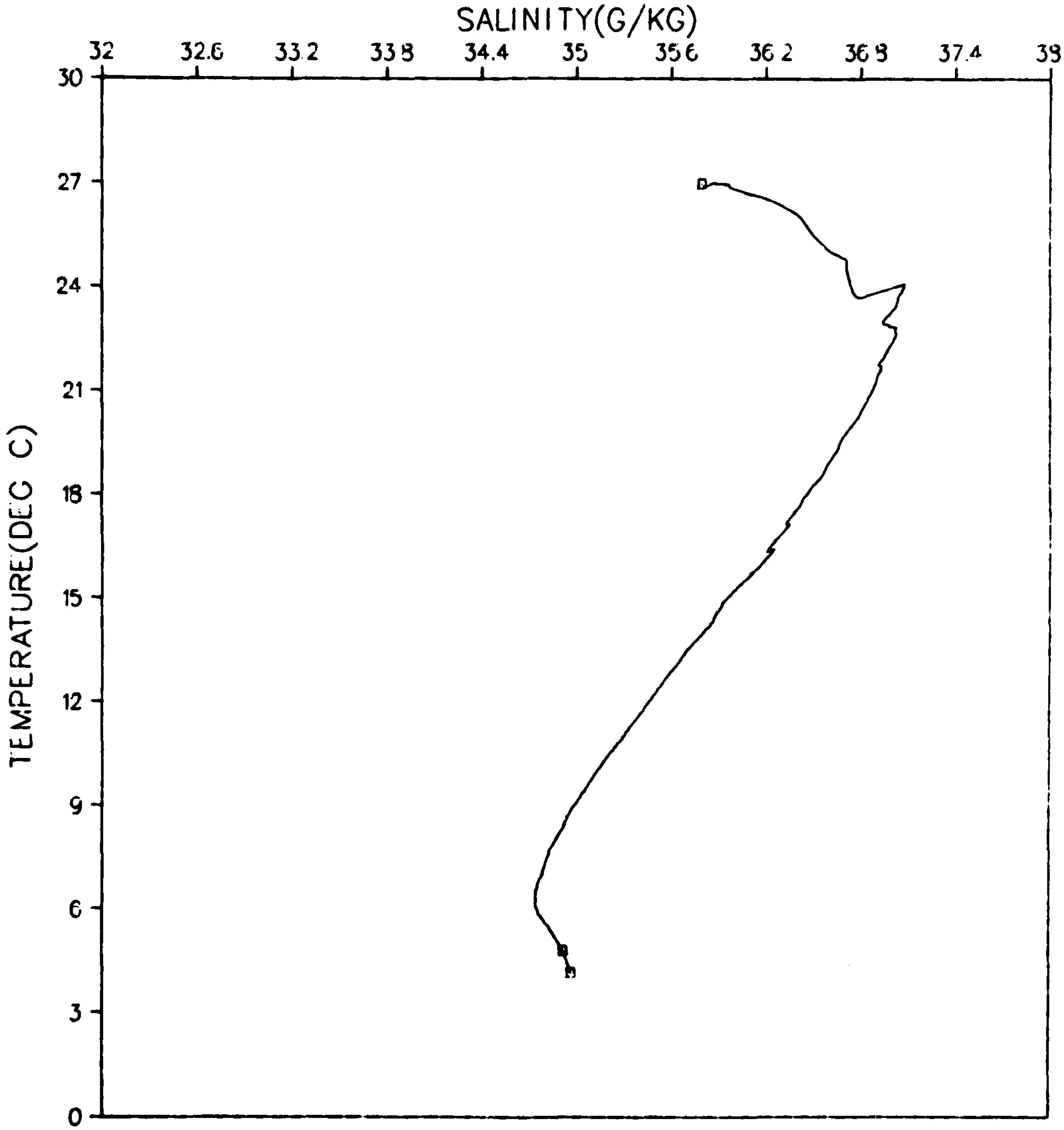


Figure 118.

GRENADA BASIN
STATION 056001
JANUARY 1980

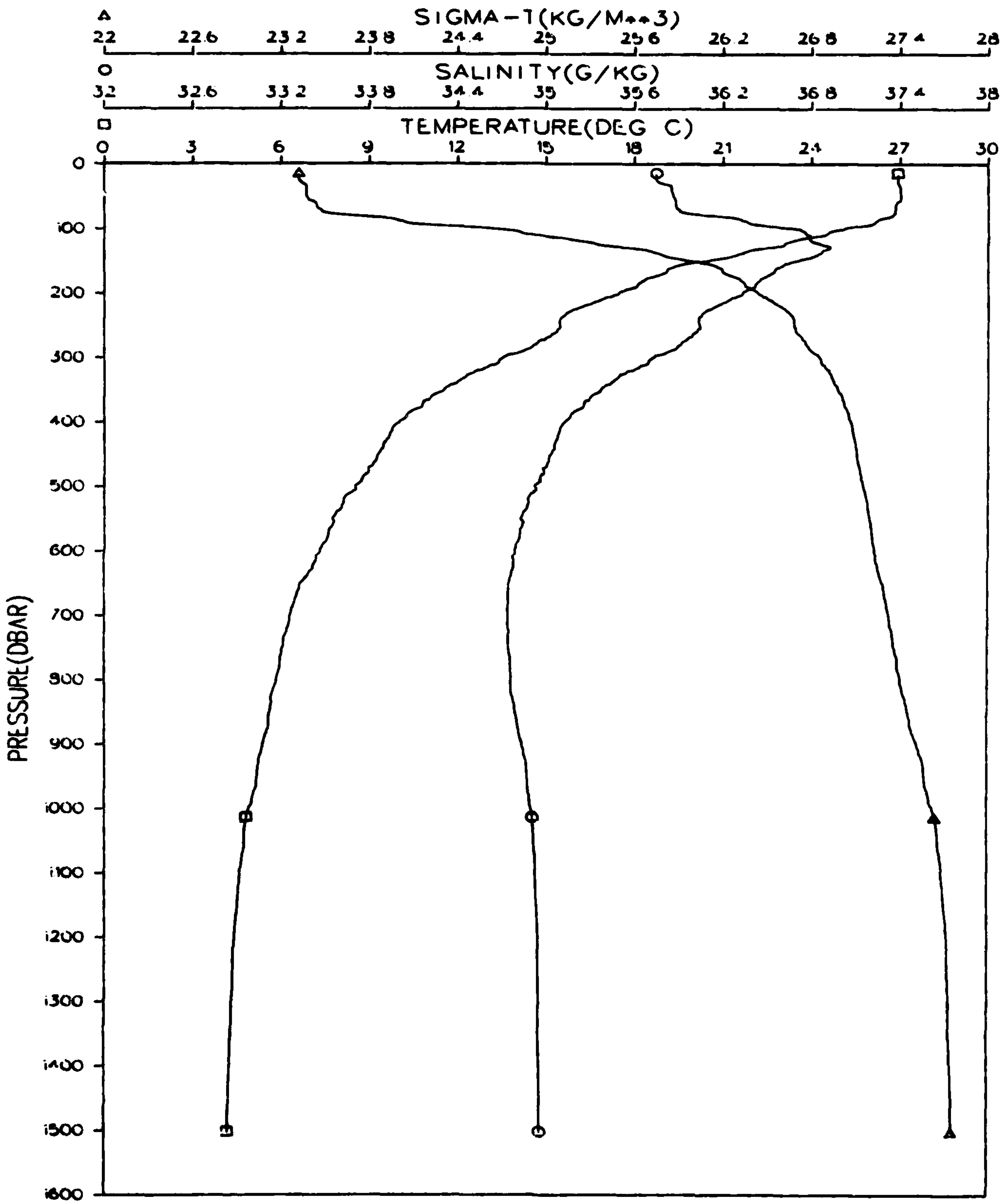


Figure 119.

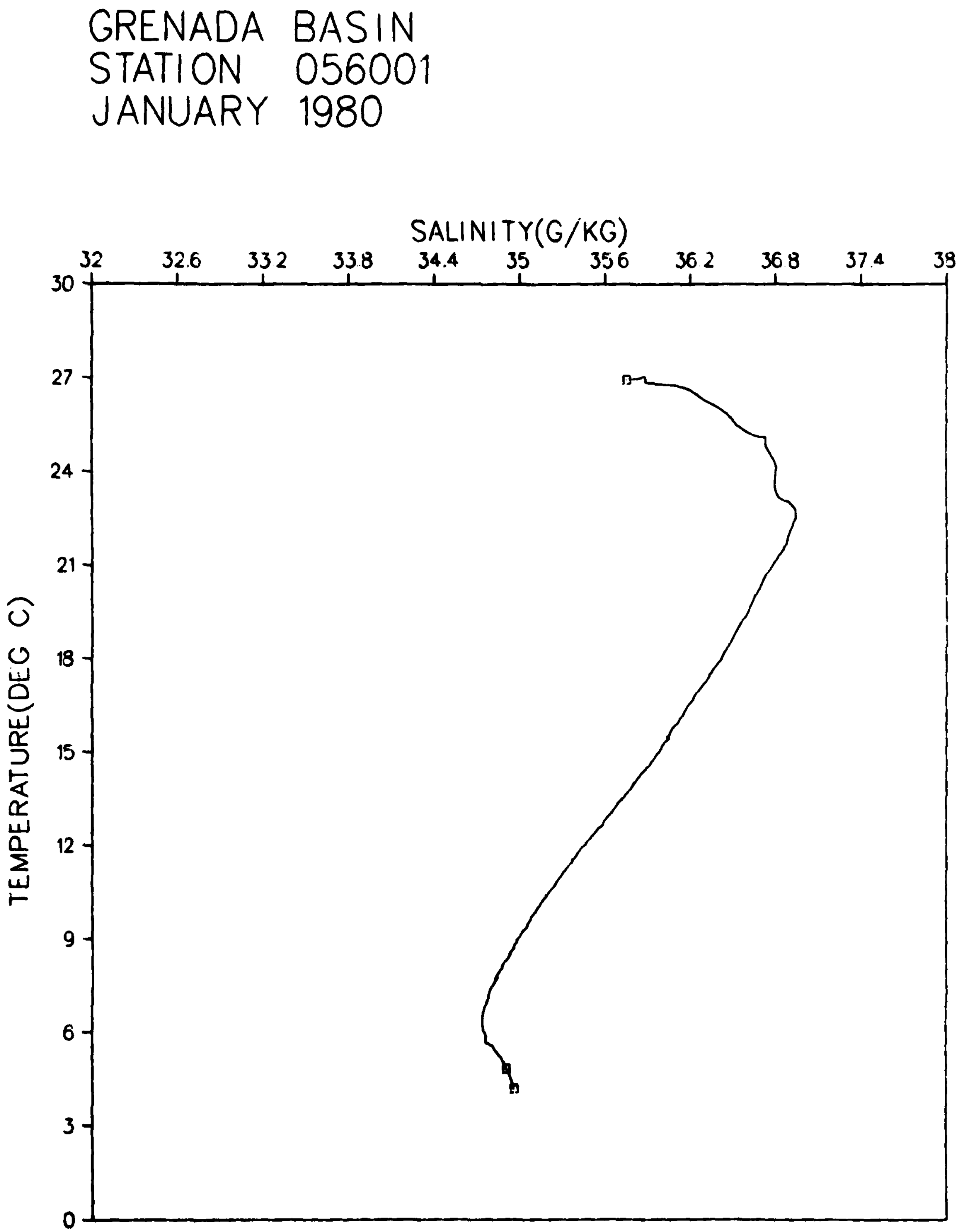

GRENADA BASIN
STATION 056001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 120.

GRENADA BASIN
STATION 057001
JANUARY 1980

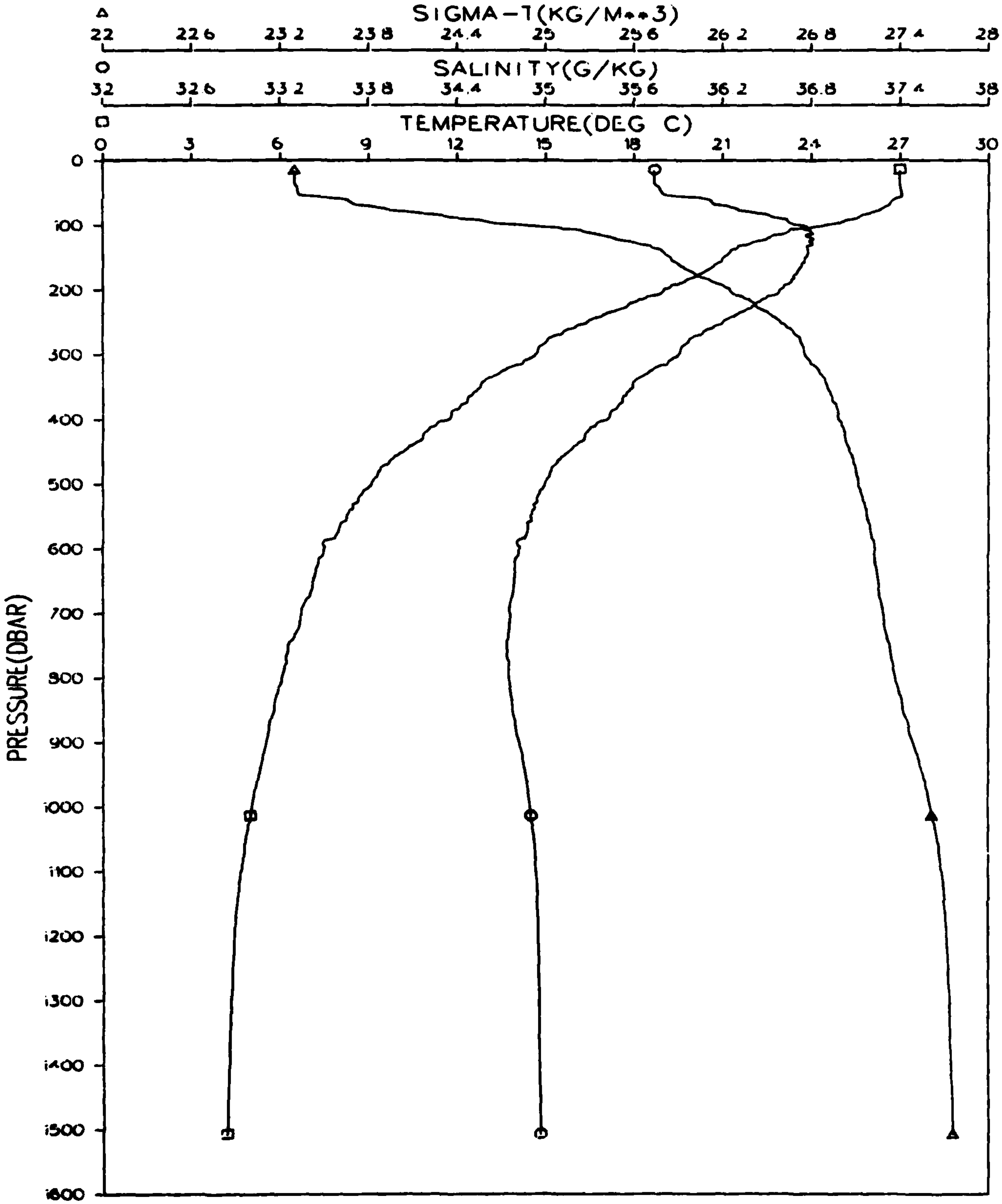


Figure 121.

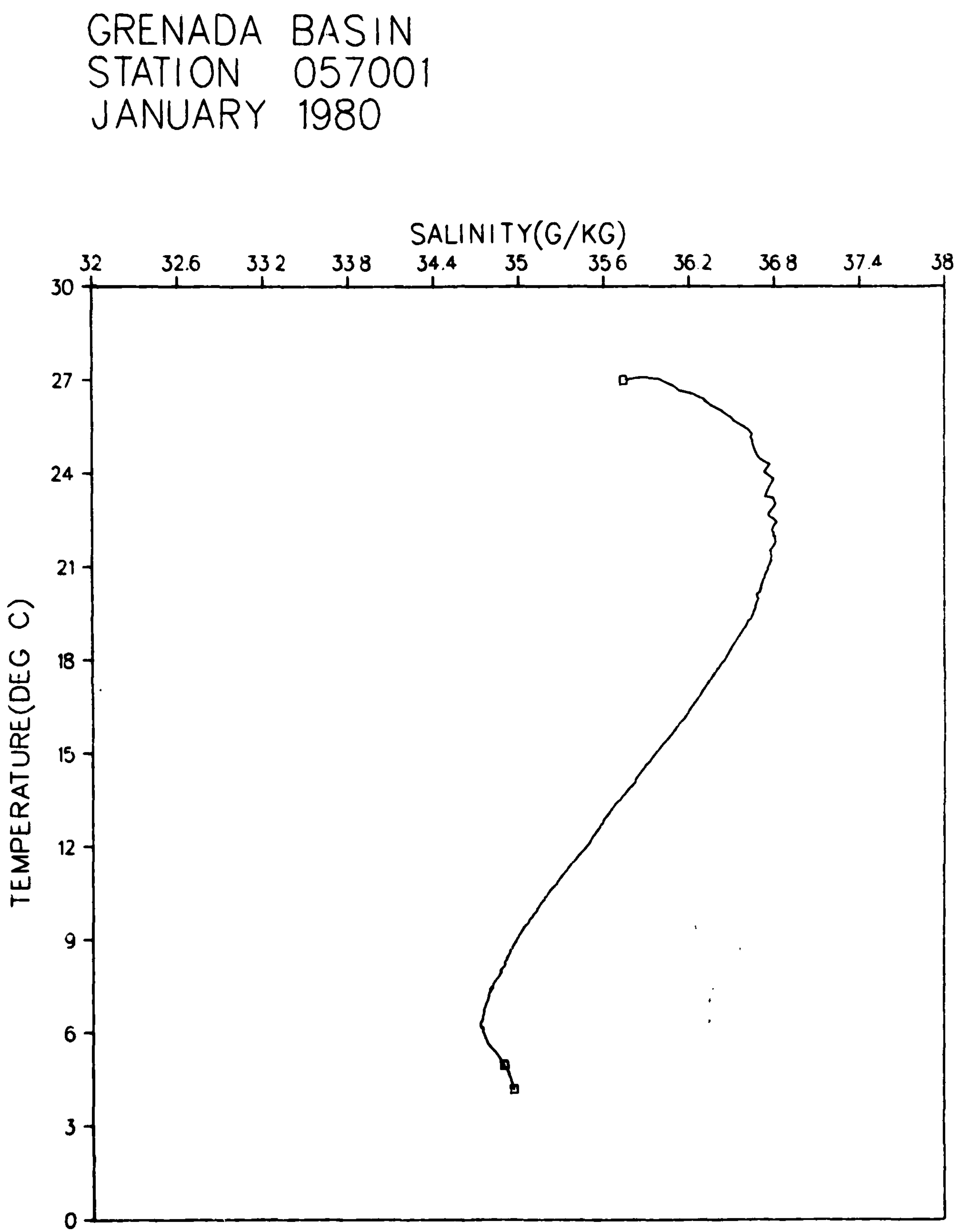
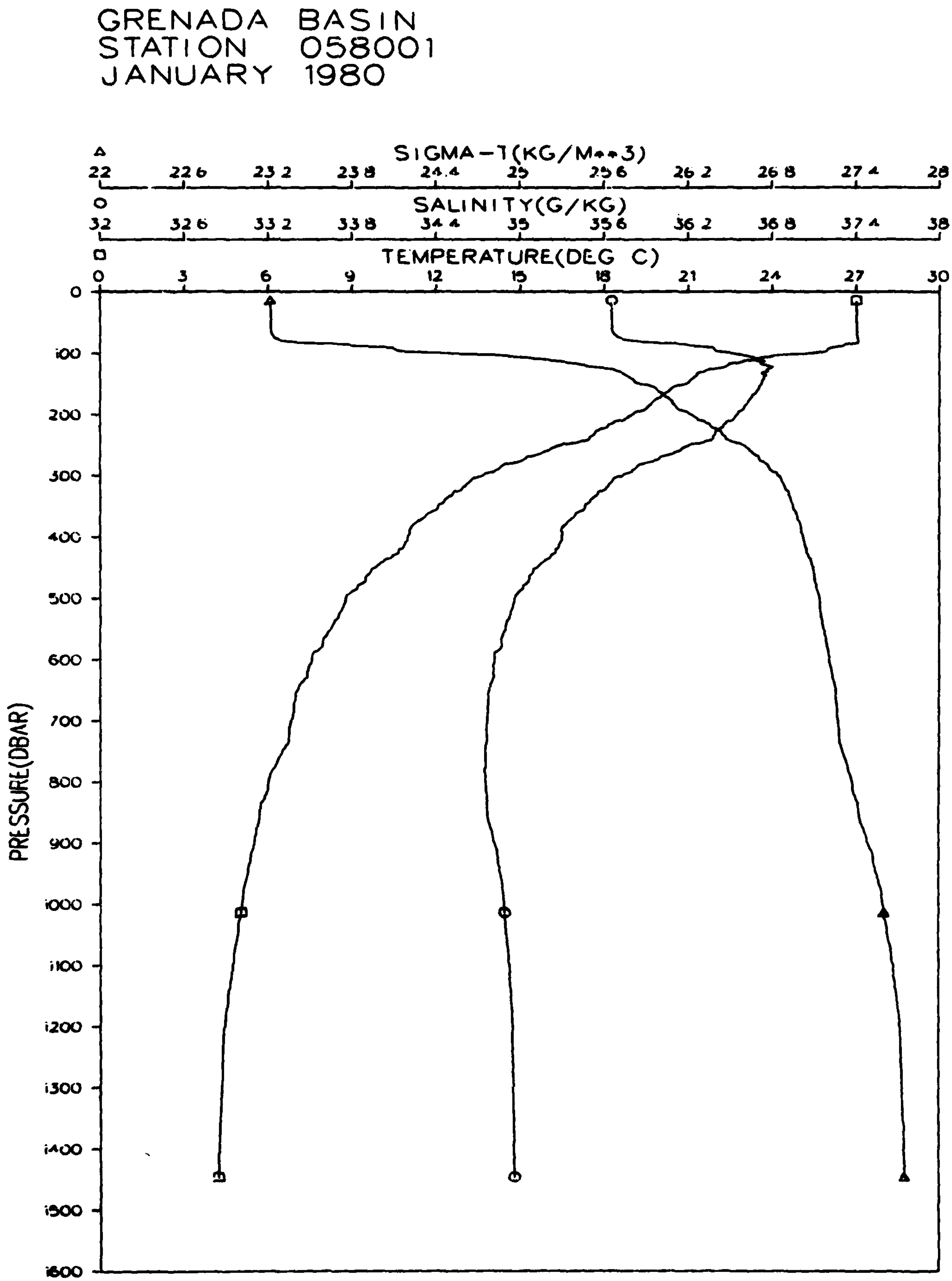

GRENADA BASIN
STATION 057001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 122.


GRENADA BASIN
STATION 058001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
Figure 123.

GRENADA BASIN
STATION 058001
JANUARY 1980

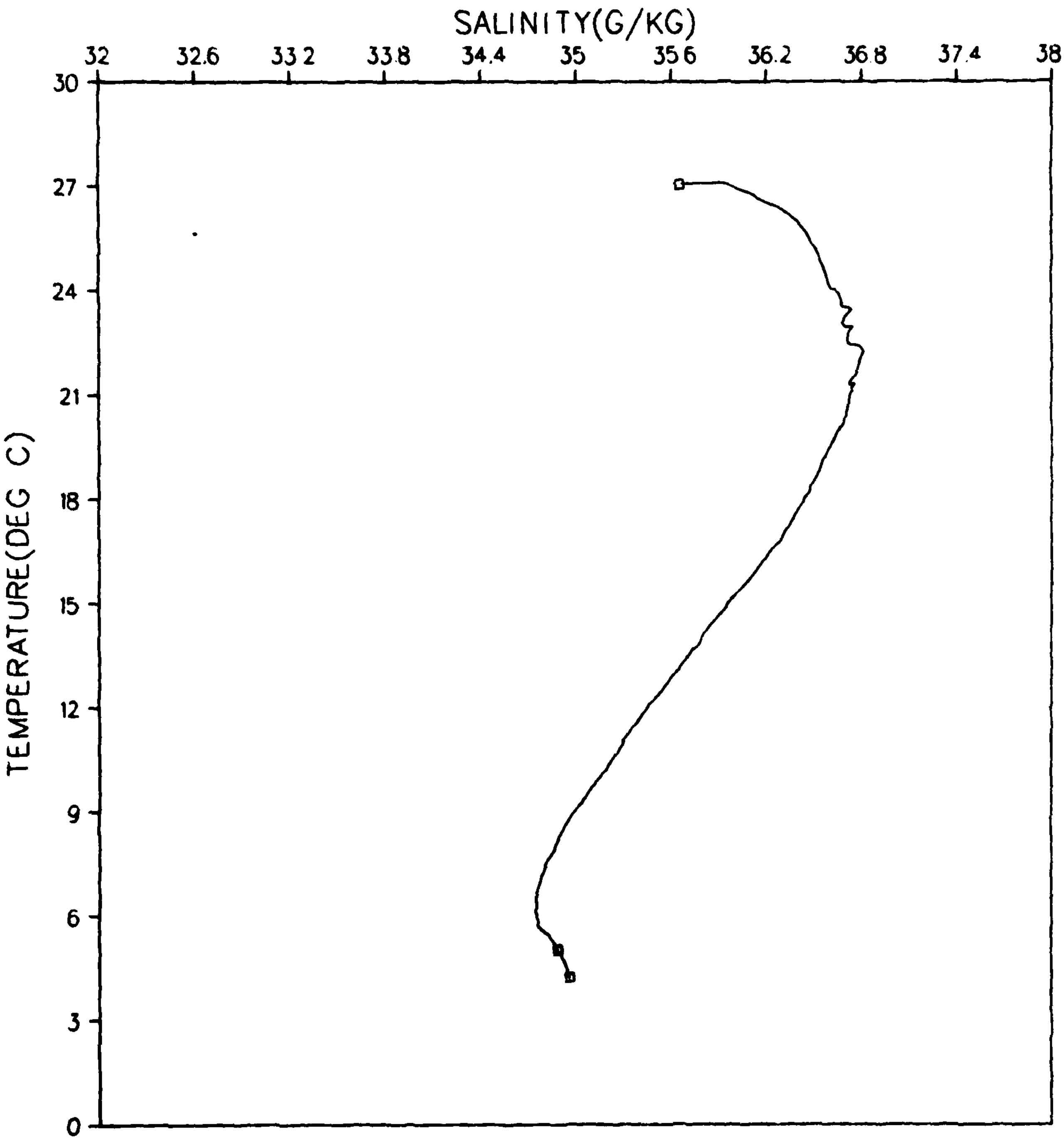


Figure 124.

GRENADA BASIN
STATION 059001
JANUARY 1980

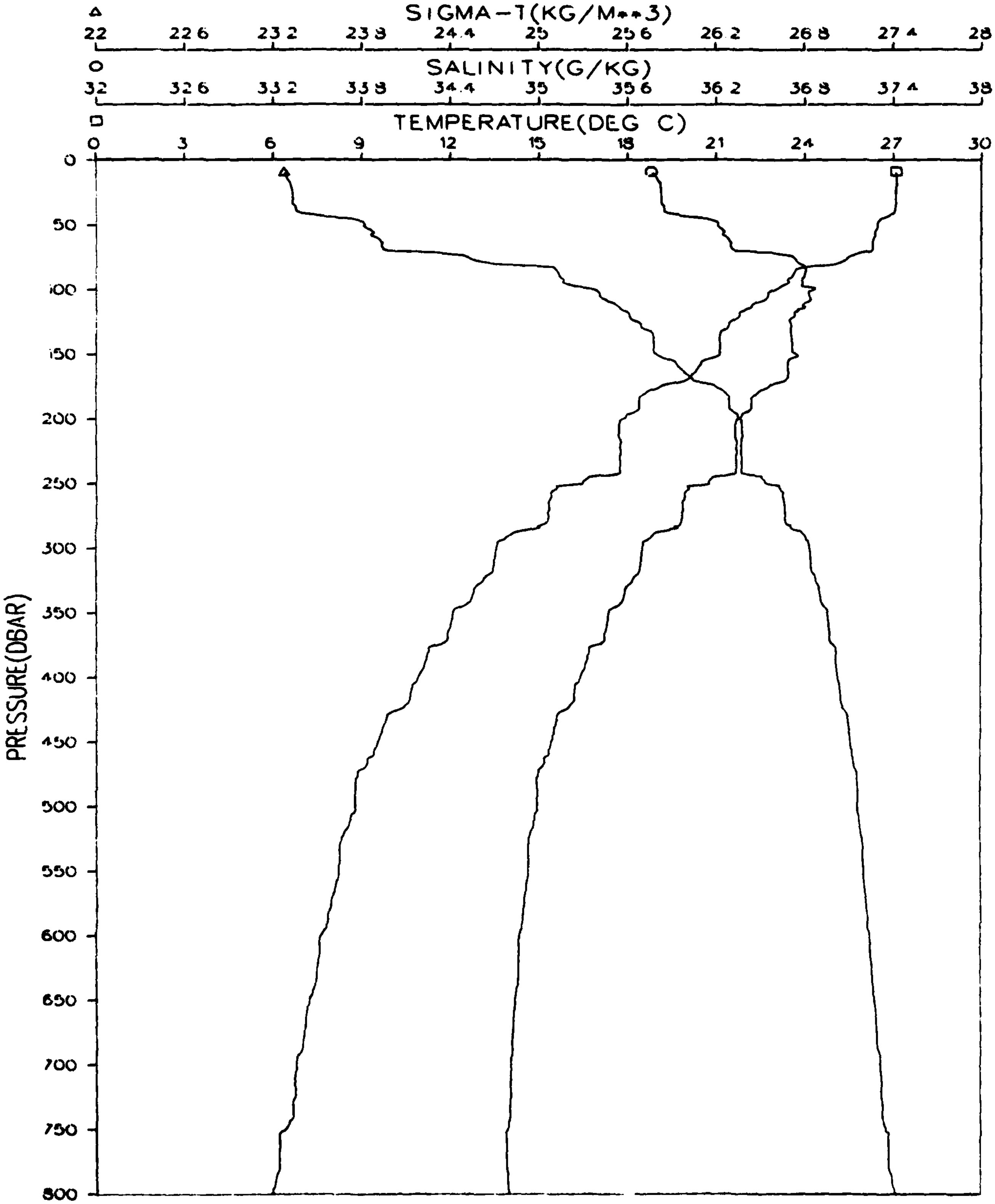


Figure 125.

GRENADA BASIN
STATION 059001
JANUARY 1980

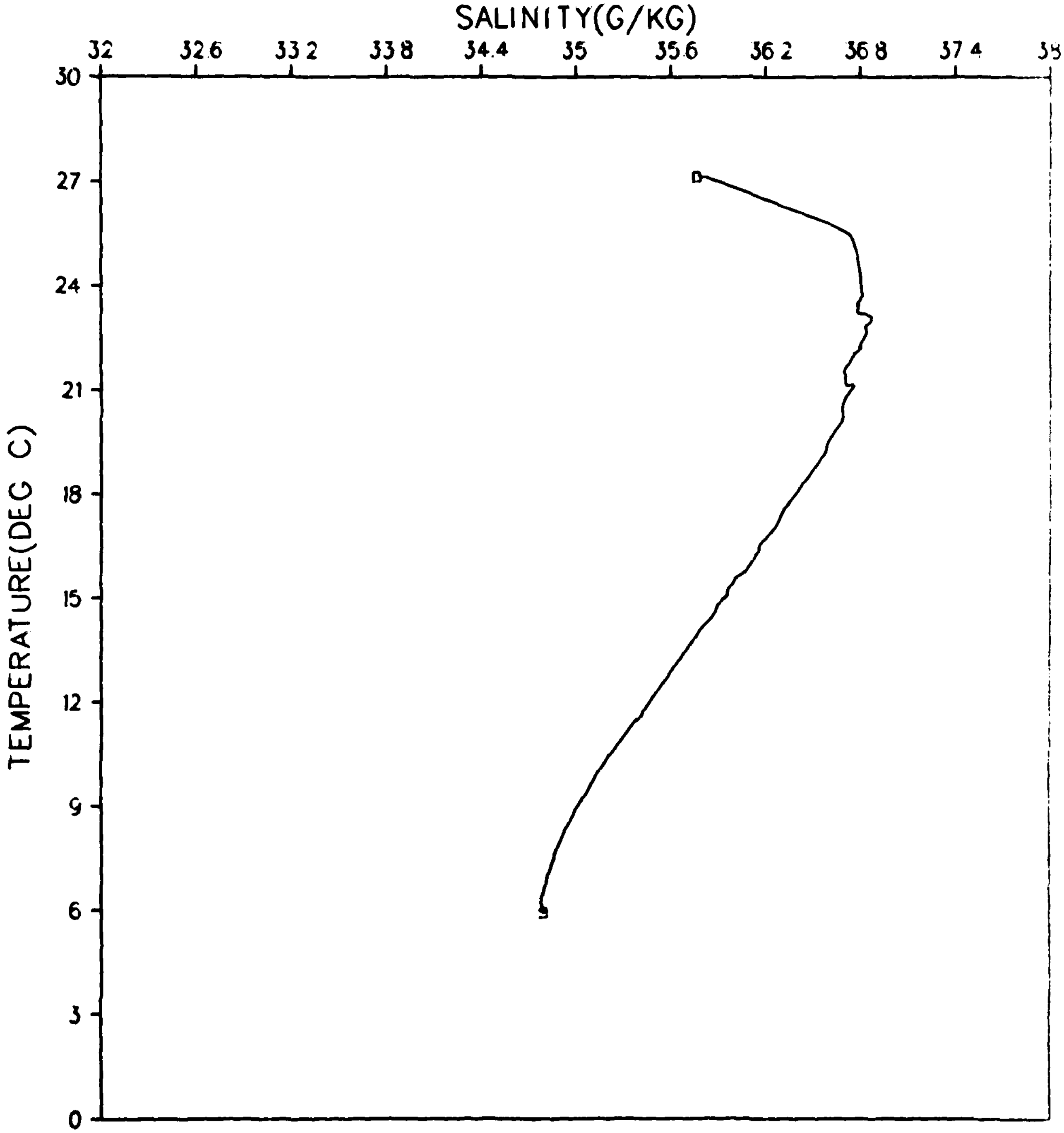


Figure 126.

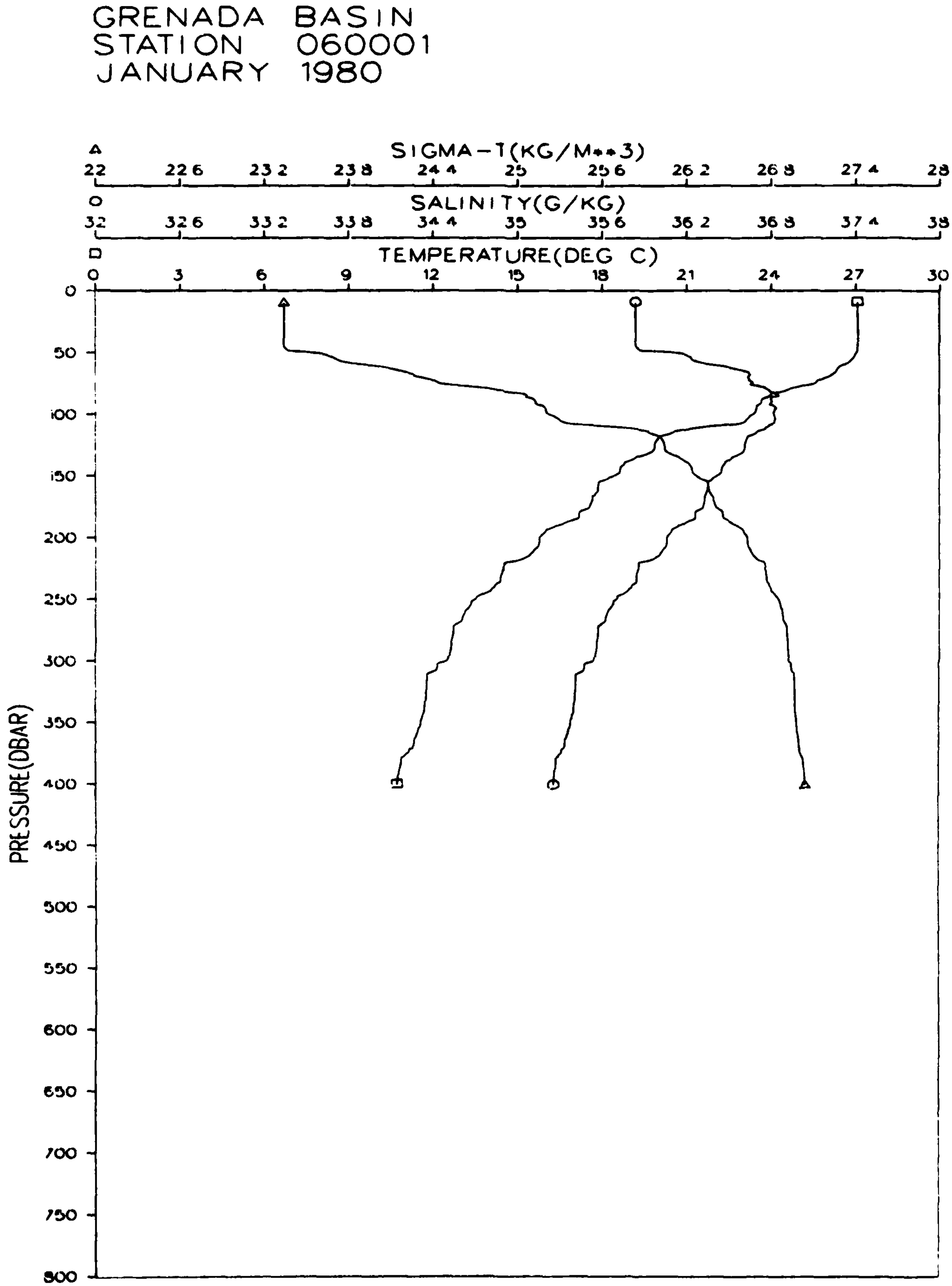

GRENADA BASIN
STATION 060001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800

Figure 127.

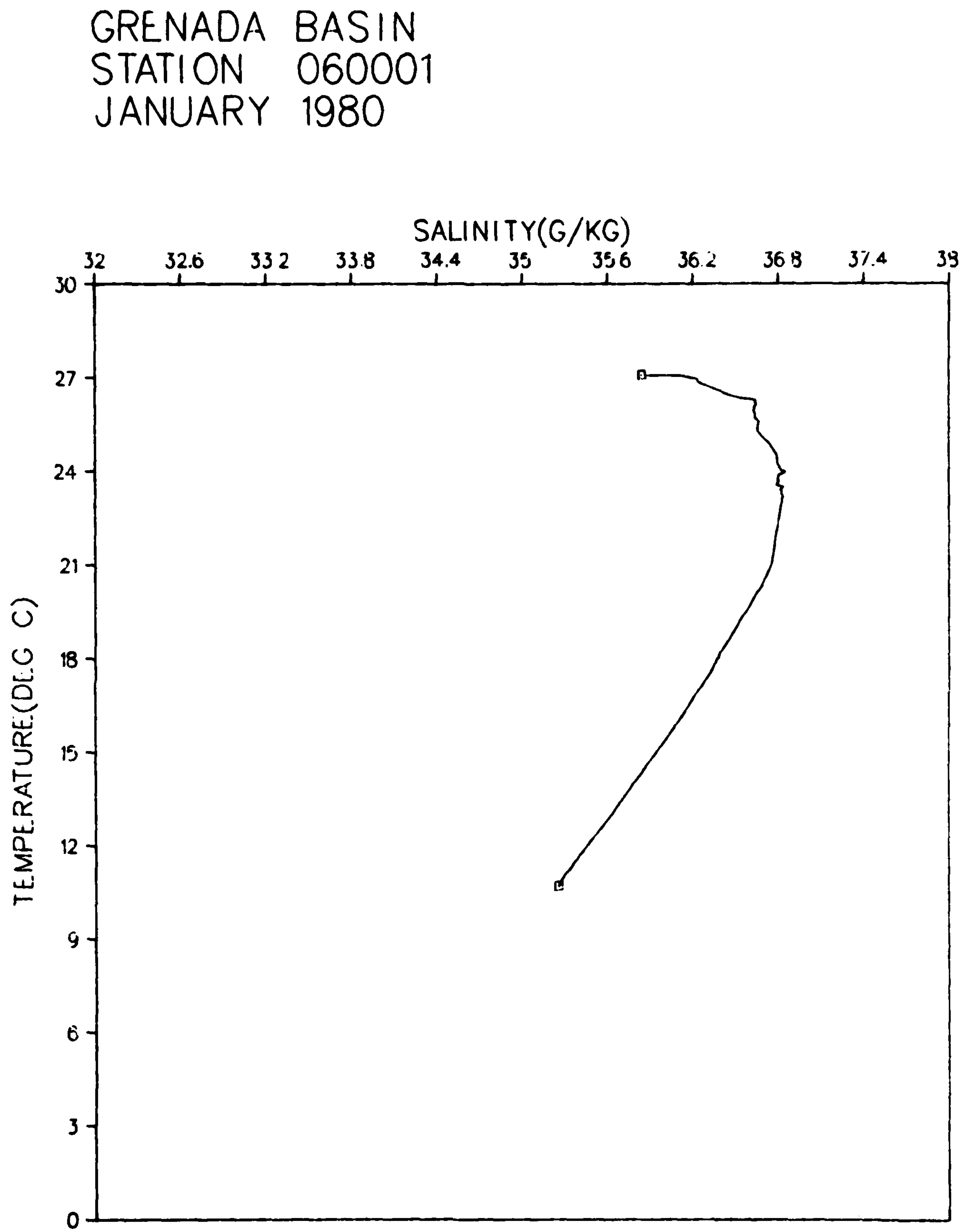

GRENADA BASIN
STATION 060001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 128.

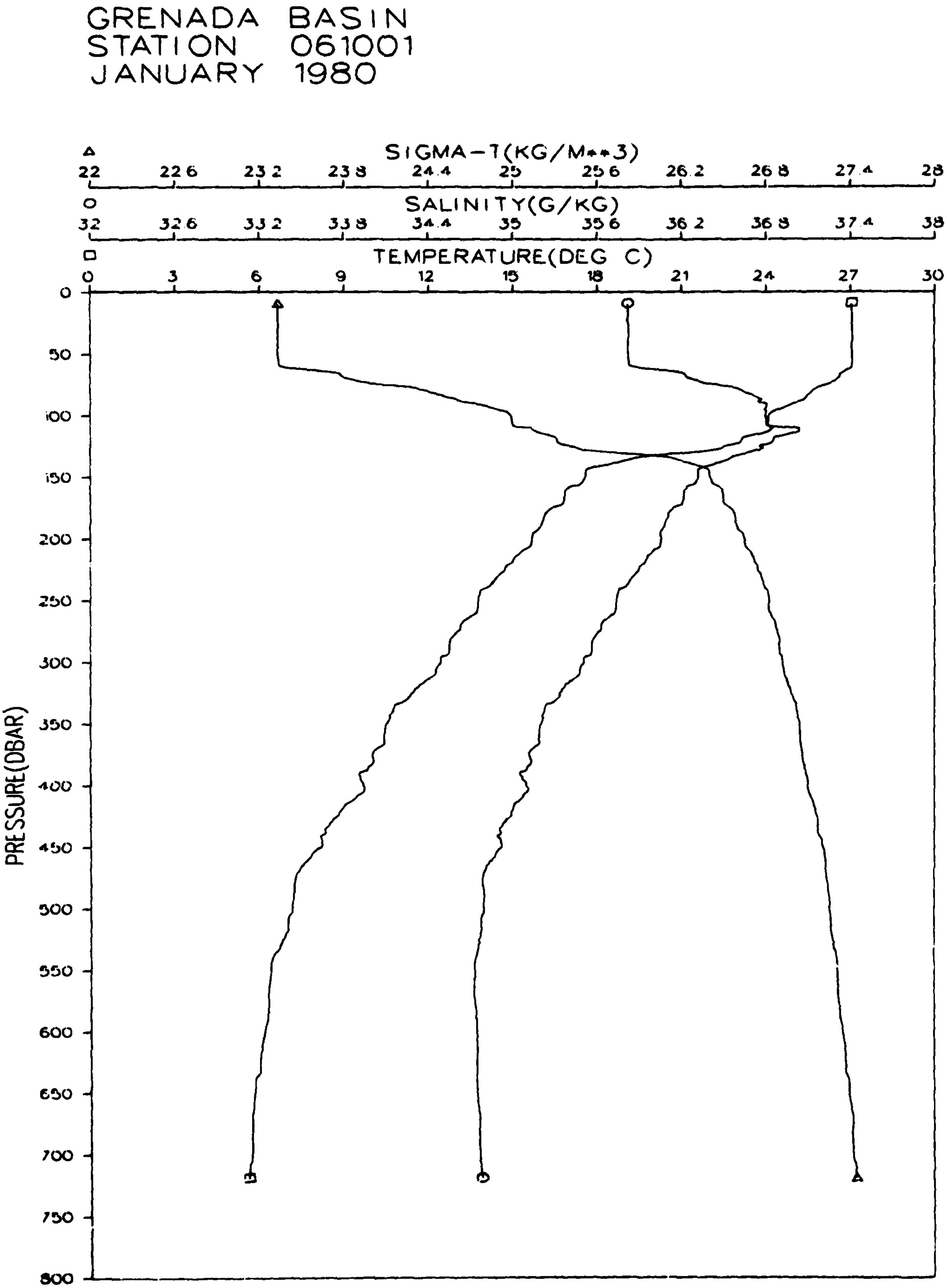

GRENADA BASIN
STATION 061001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800

Figure 129.

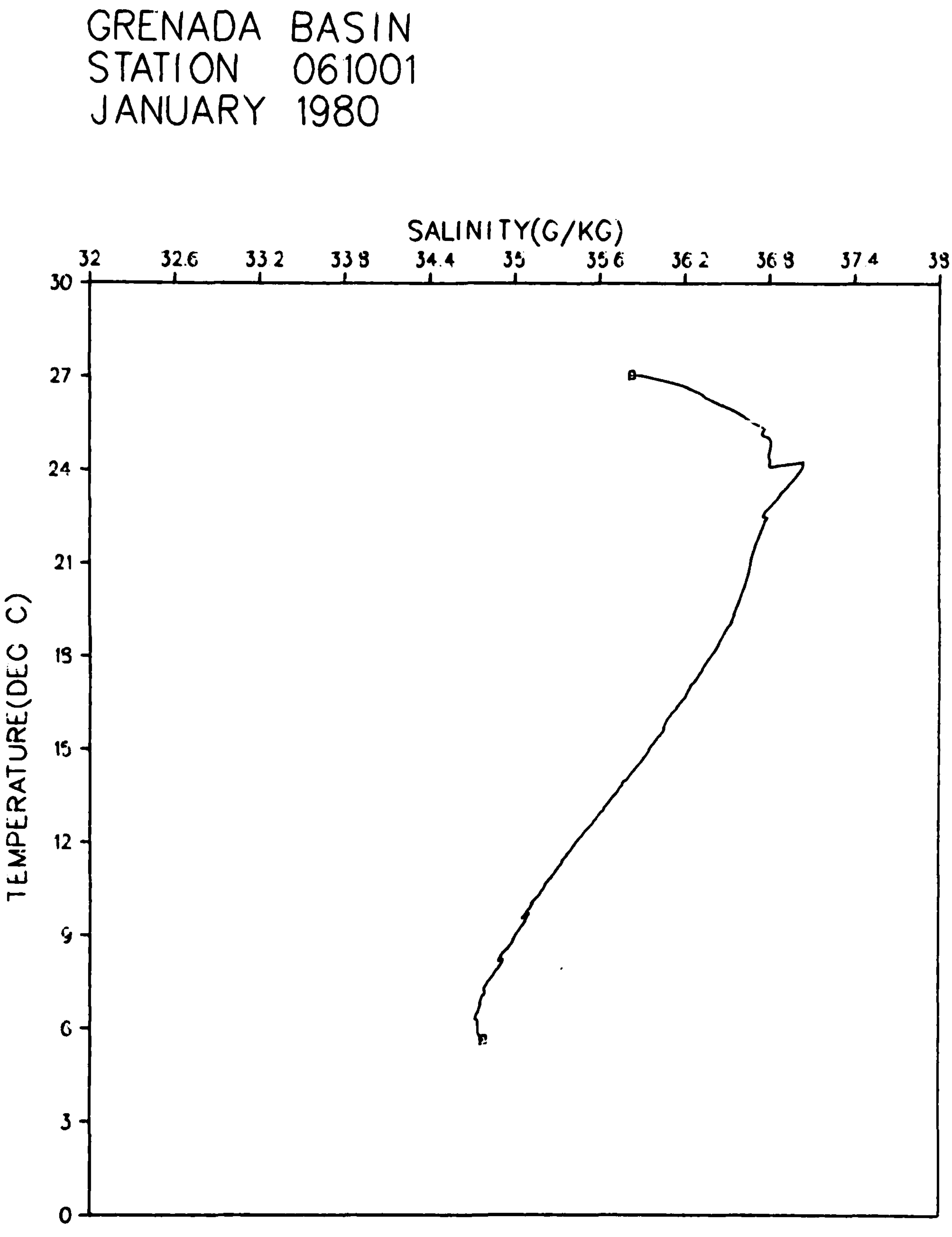

GRENADA BASIN
STATION 061001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 130.

GRENADA BASIN
STATION 062001
JANUARY 1980

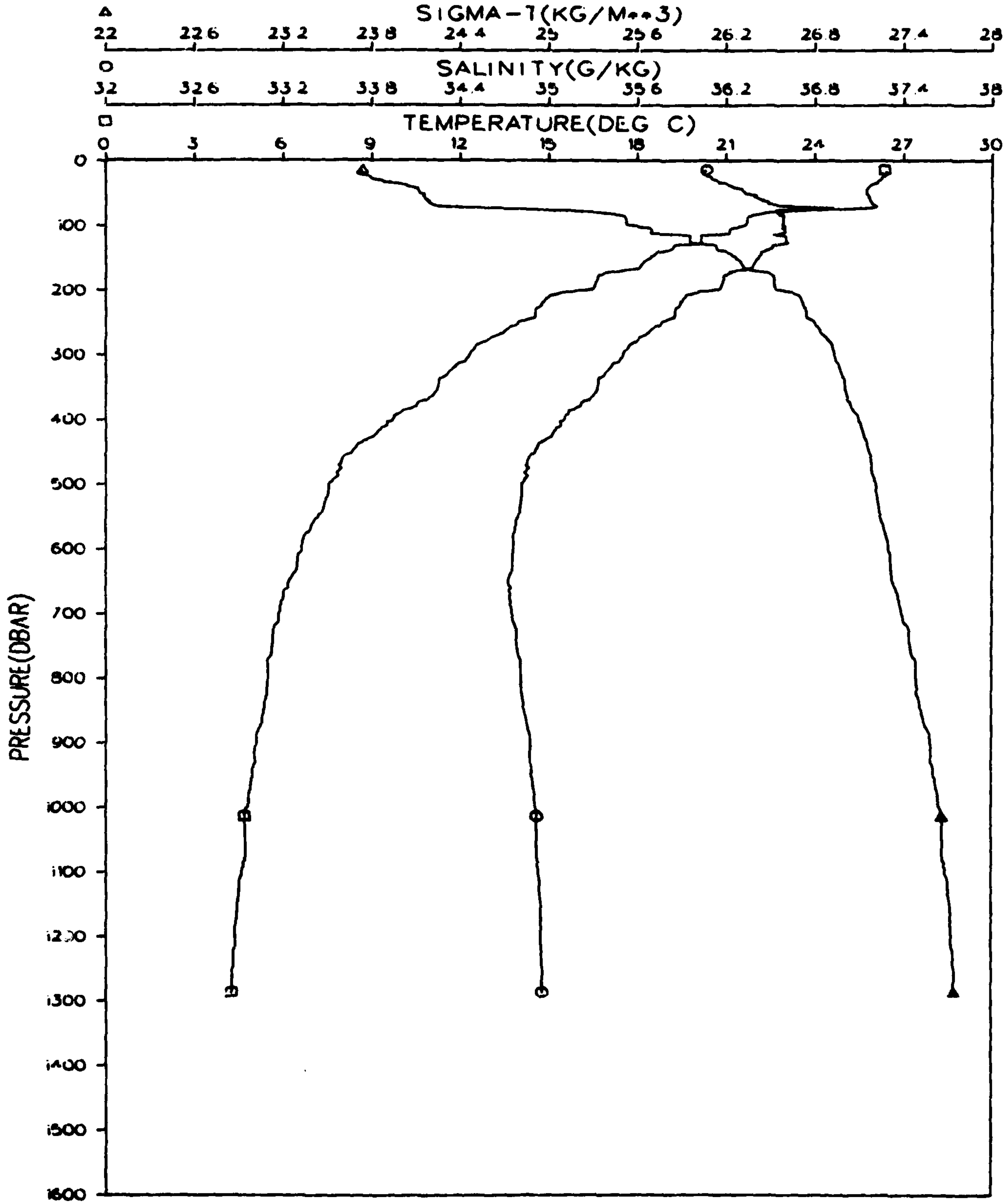


Figure 131.

GRENADA BASIN
STATION 062001
JANUARY 1980

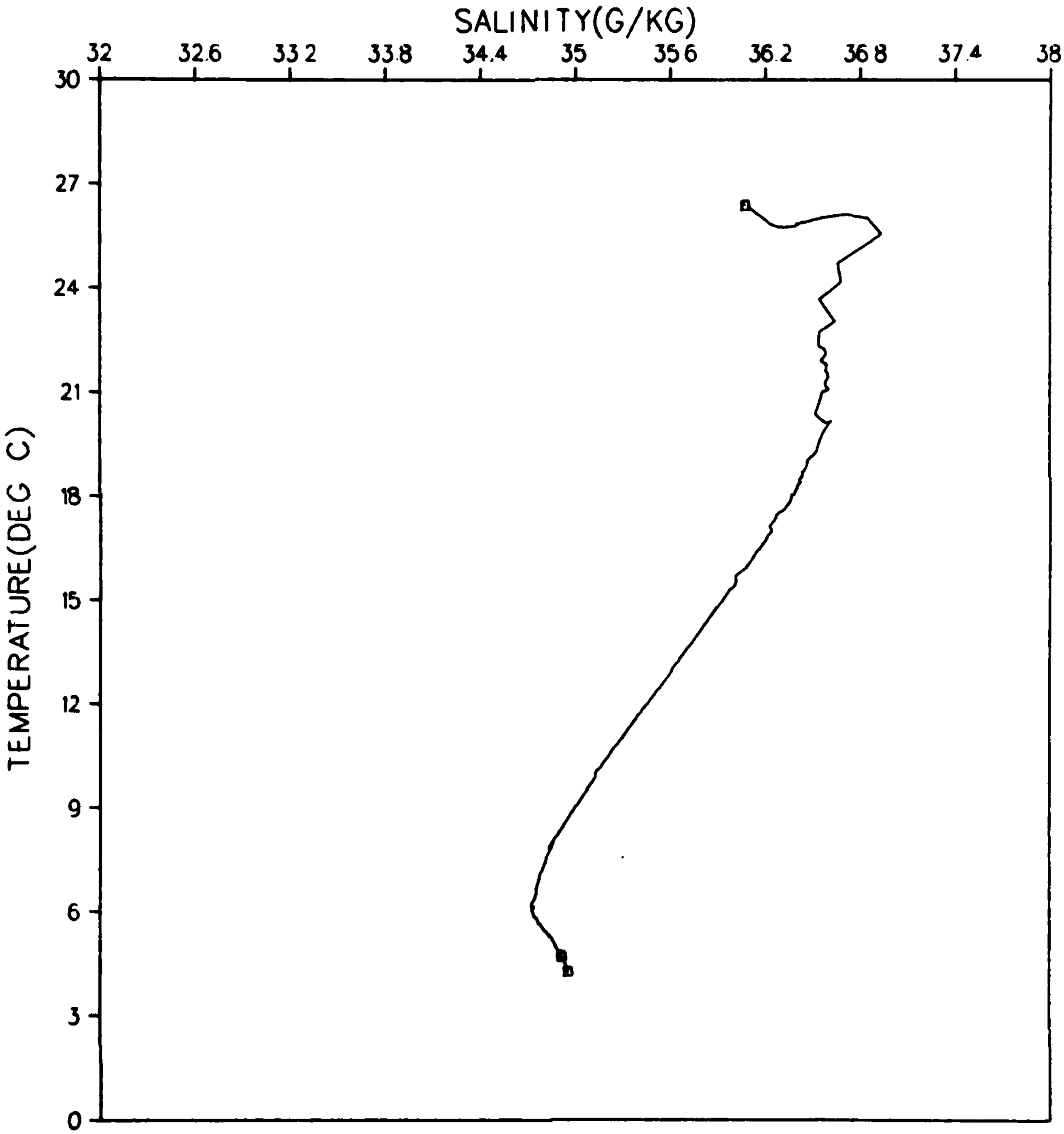
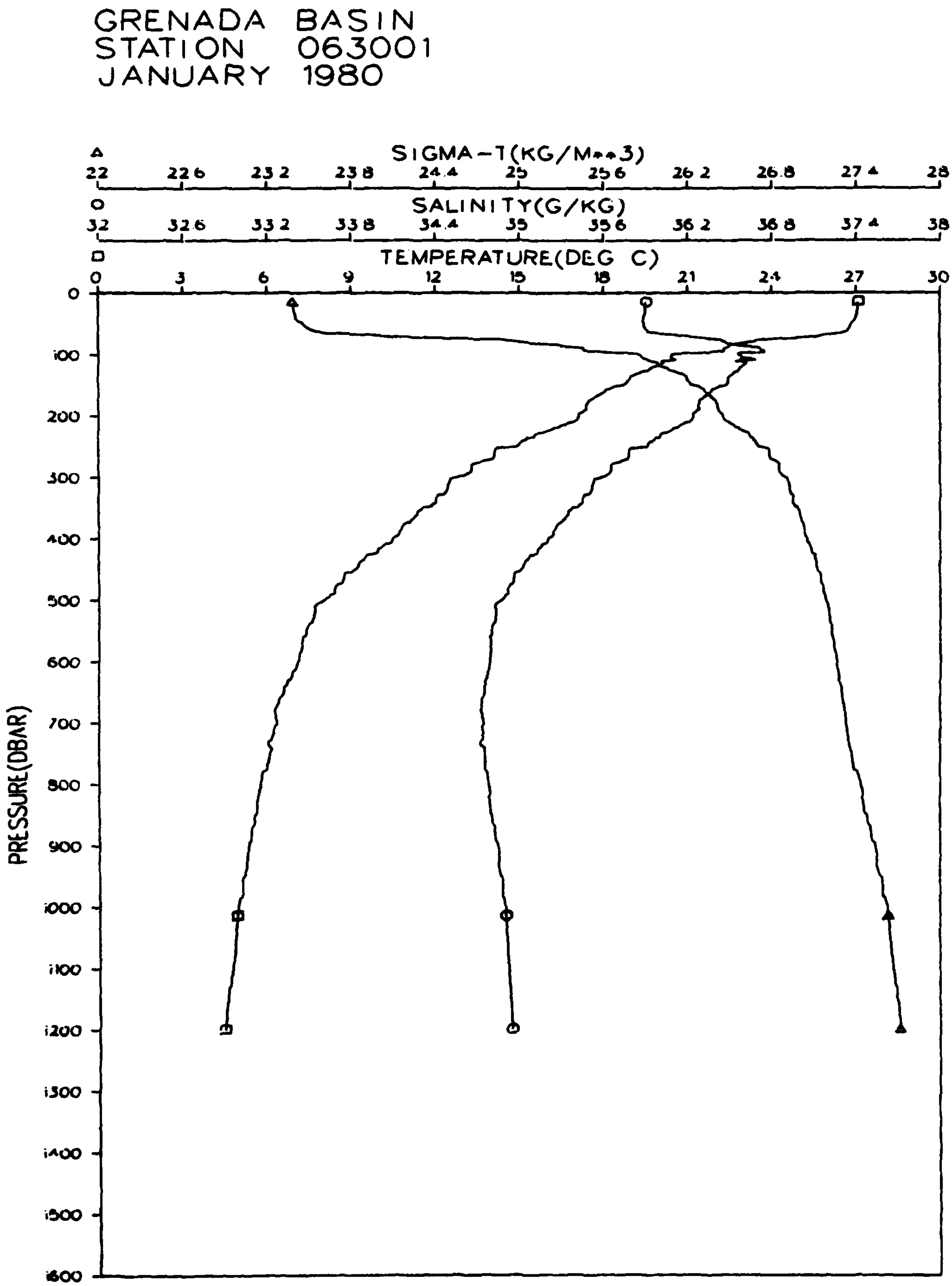


Figure 132.



GRENADA BASIN
STATION 063001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 133.

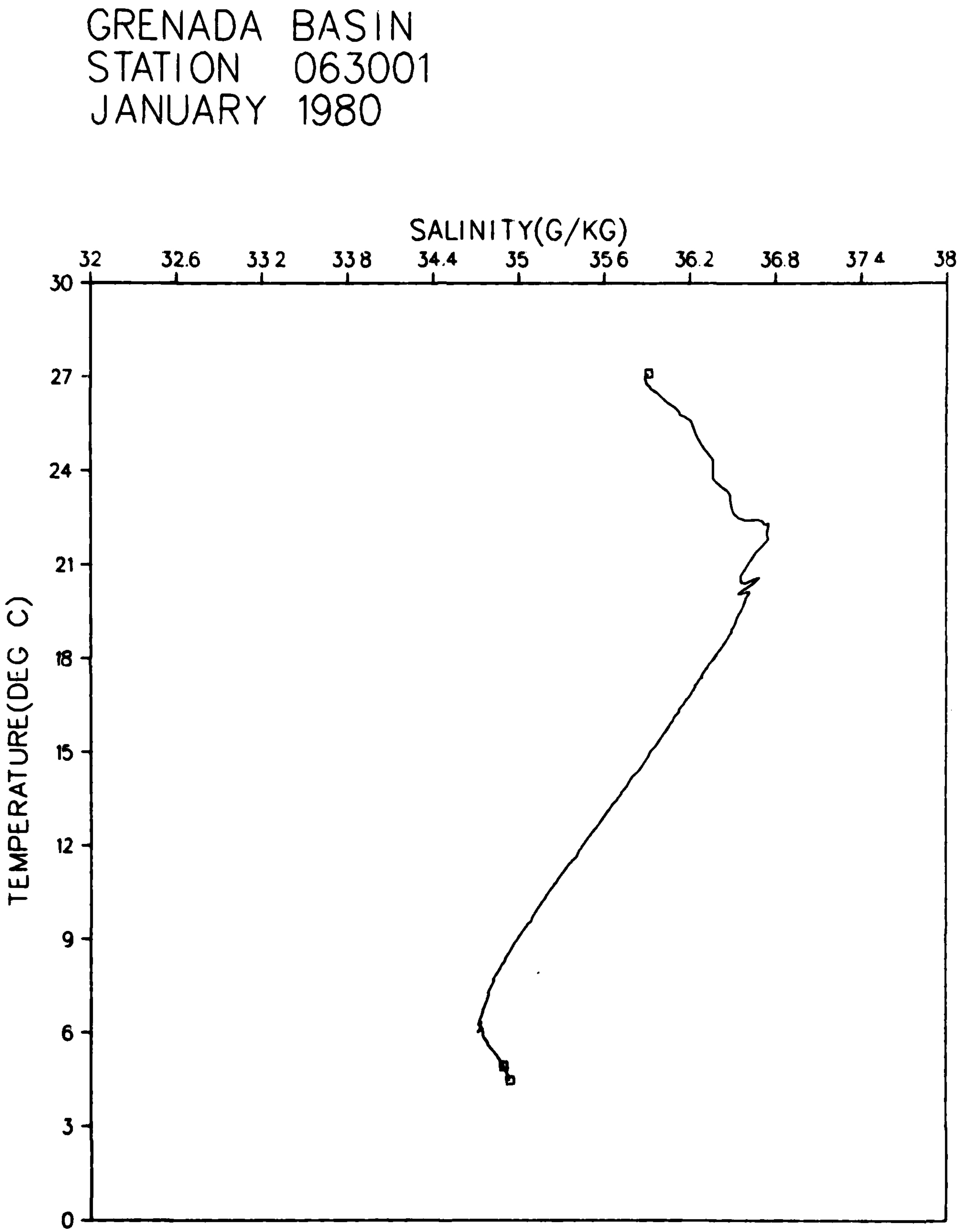

GRENADA BASIN
STATION 063001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 134.

GRENADA BASIN
STATION 064001
JANUARY 1980

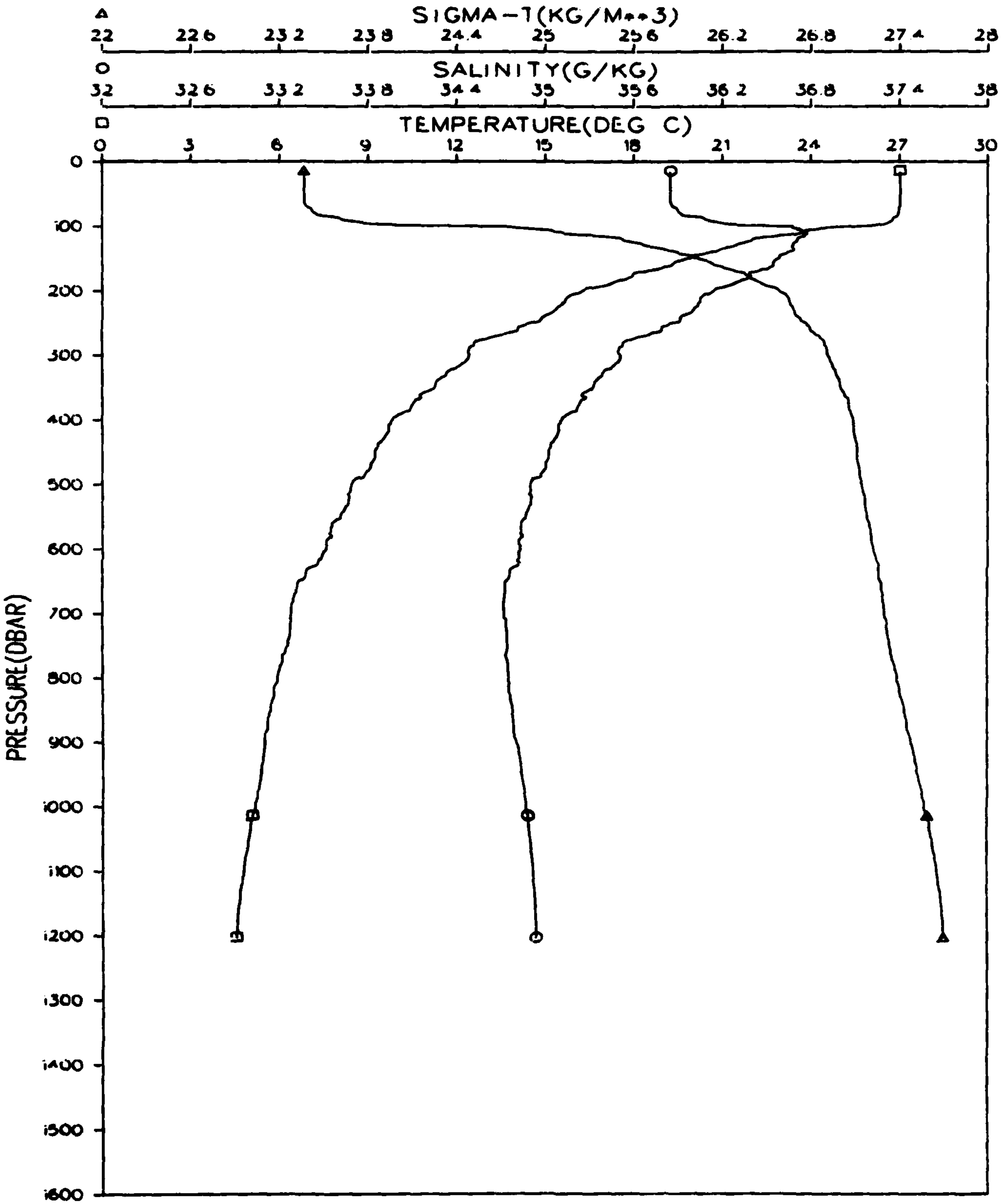


Figure 135.

GRENADA BASIN
STATION 064001
JANUARY 1980

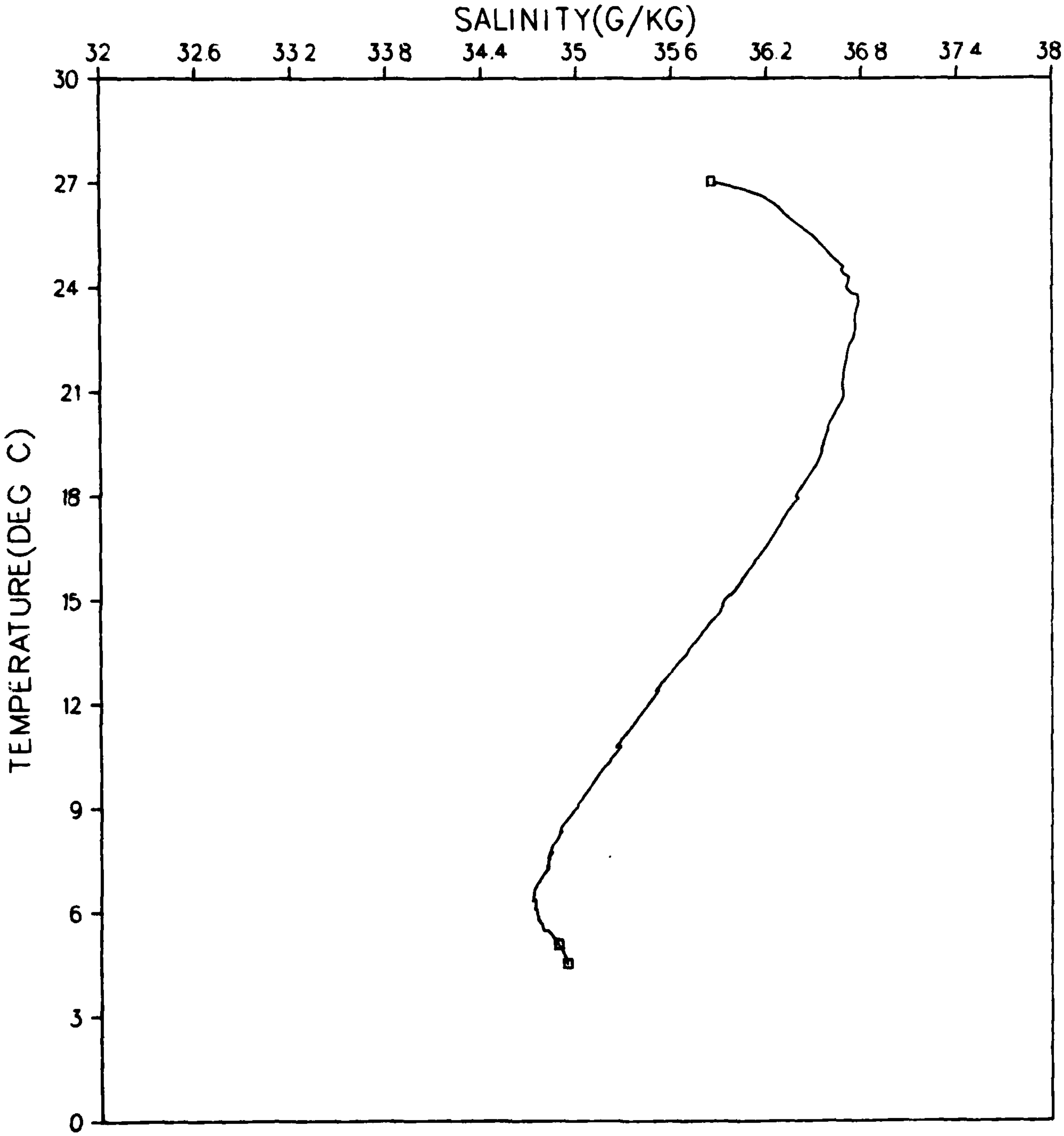


Figure 136.

GRENADA BASIN
STATION 065001
JANUARY 1980

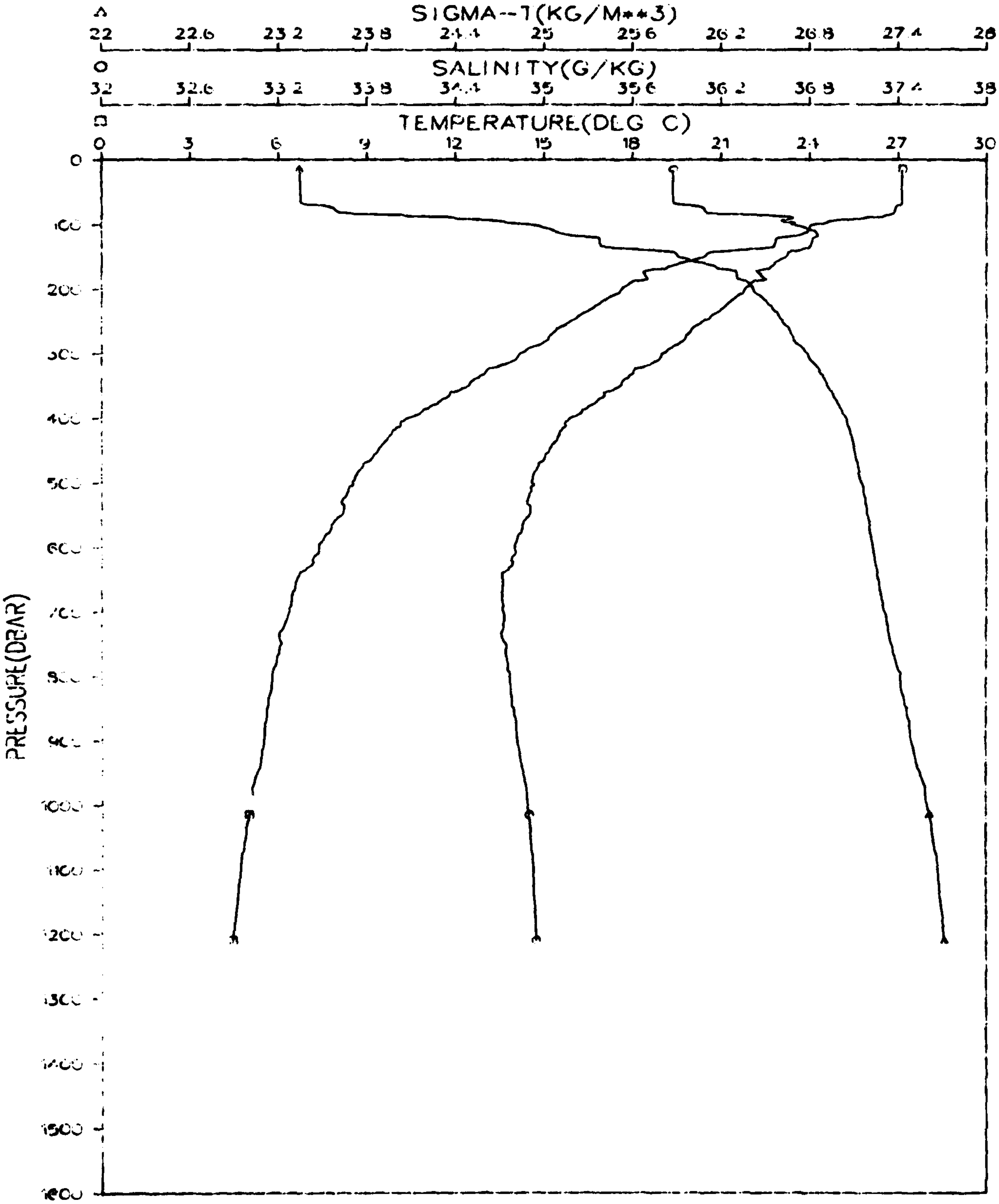


Figure 137.

GRENADA BASIN
STATION 065001
JANUARY 1980

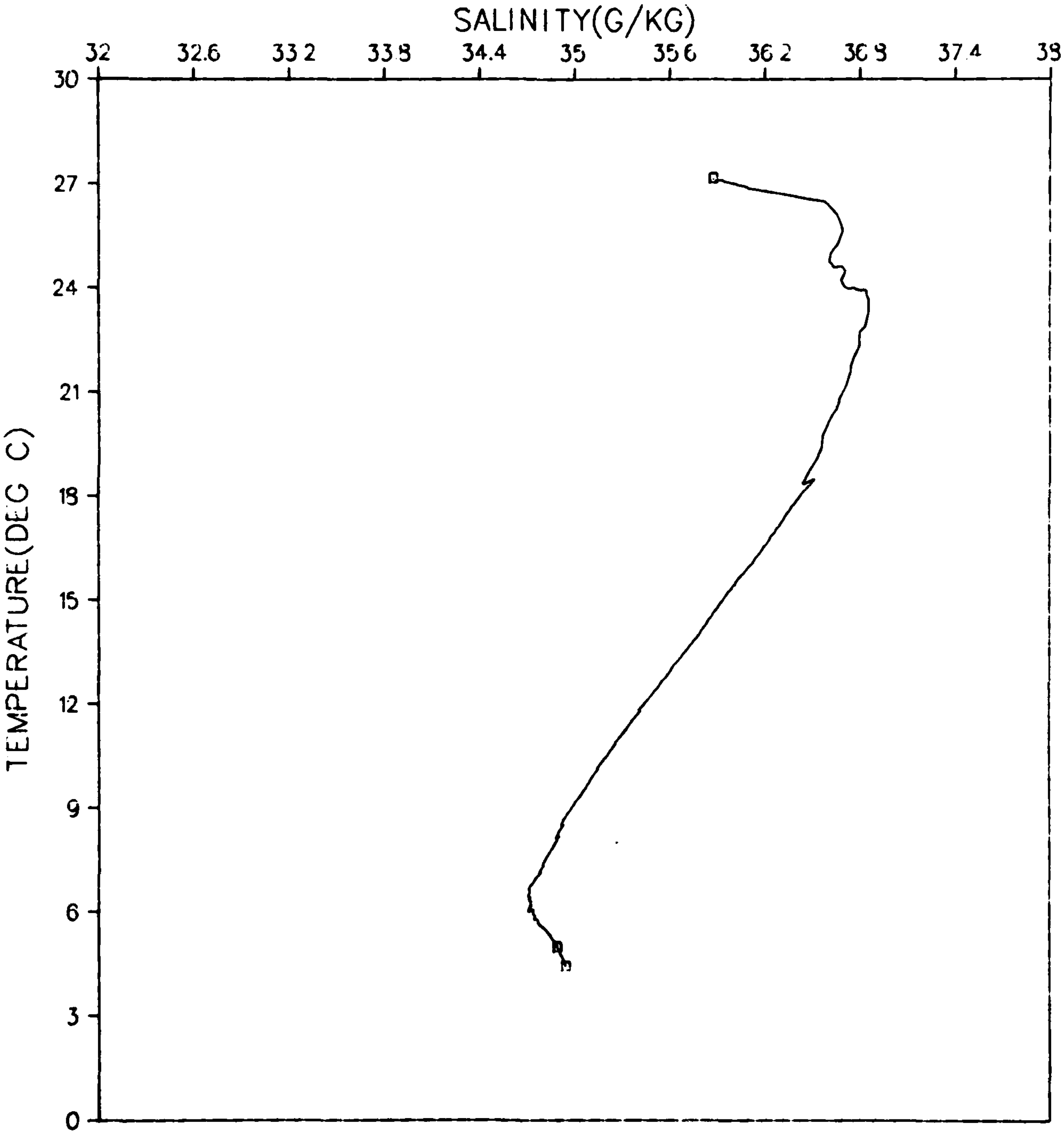


Figure 138.

GRENADA BASIN
STATION 066001
JANUARY 1980

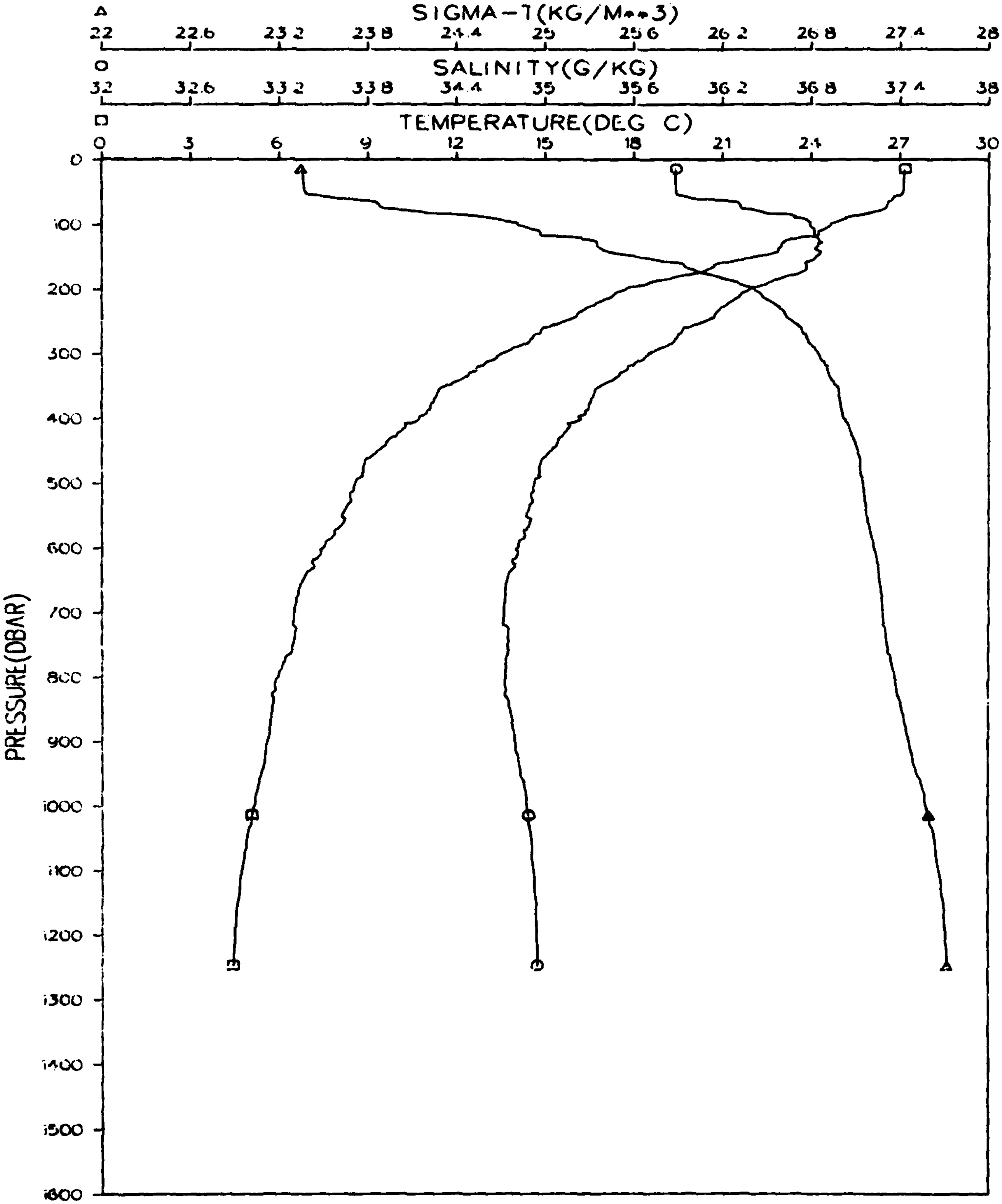


Figure 139.

GRENADA BASIN
STATION 066001
JANUARY 1980

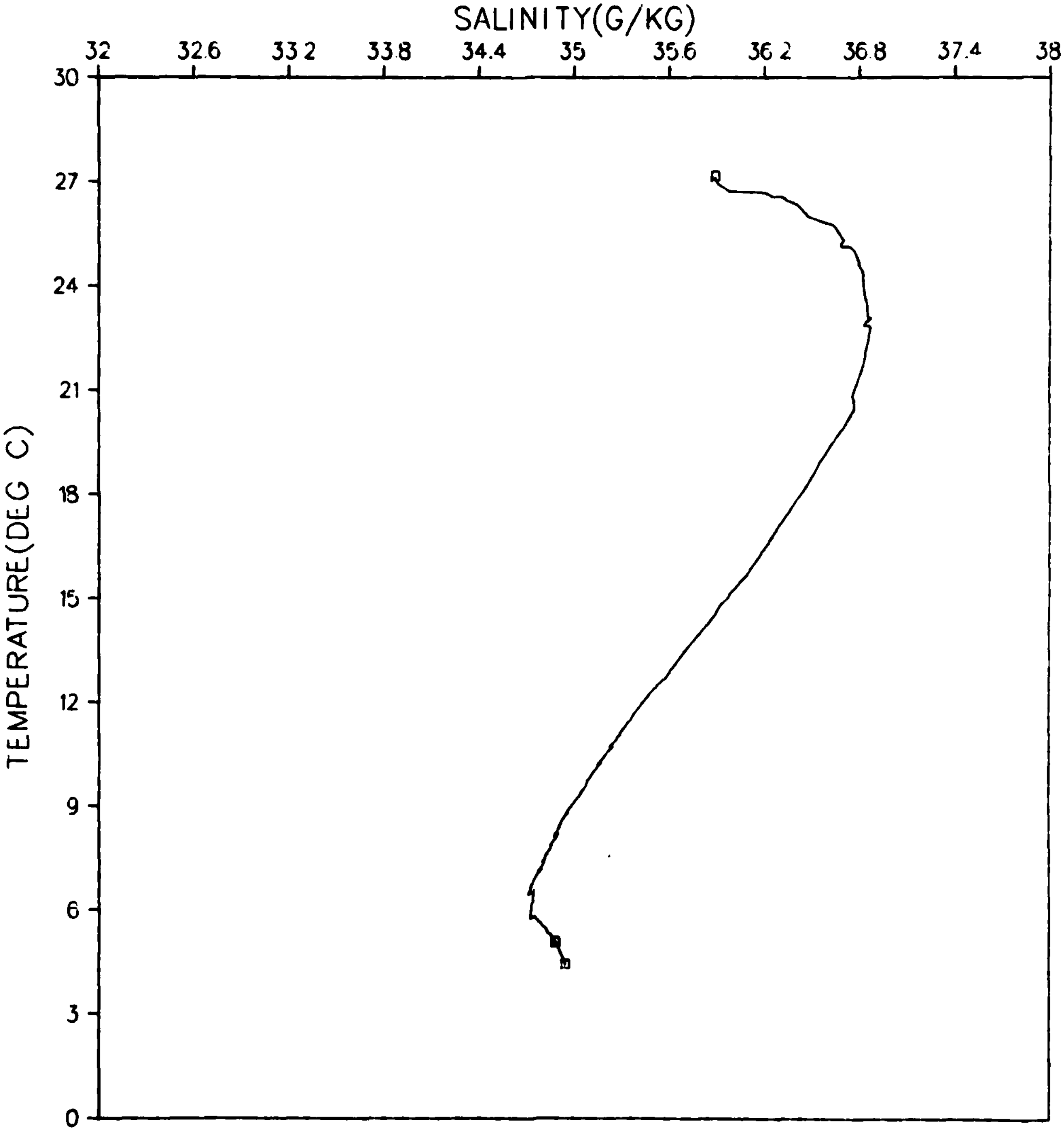


Figure 140.

GRENADA BASIN
STATION 067001
JANUARY 1980

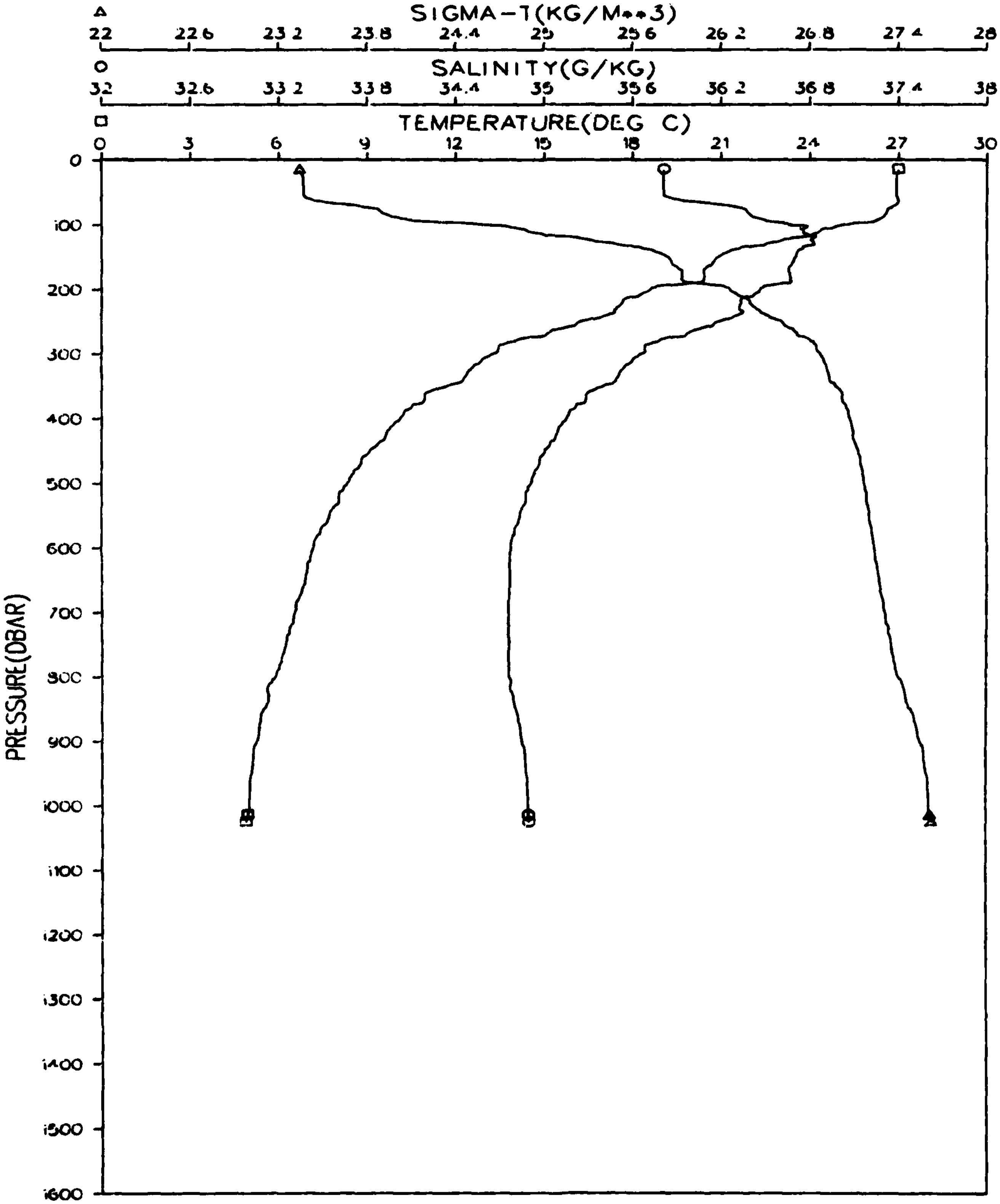


Figure 141.

GRENADA BASIN
STATION 067001
JANUARY 1980

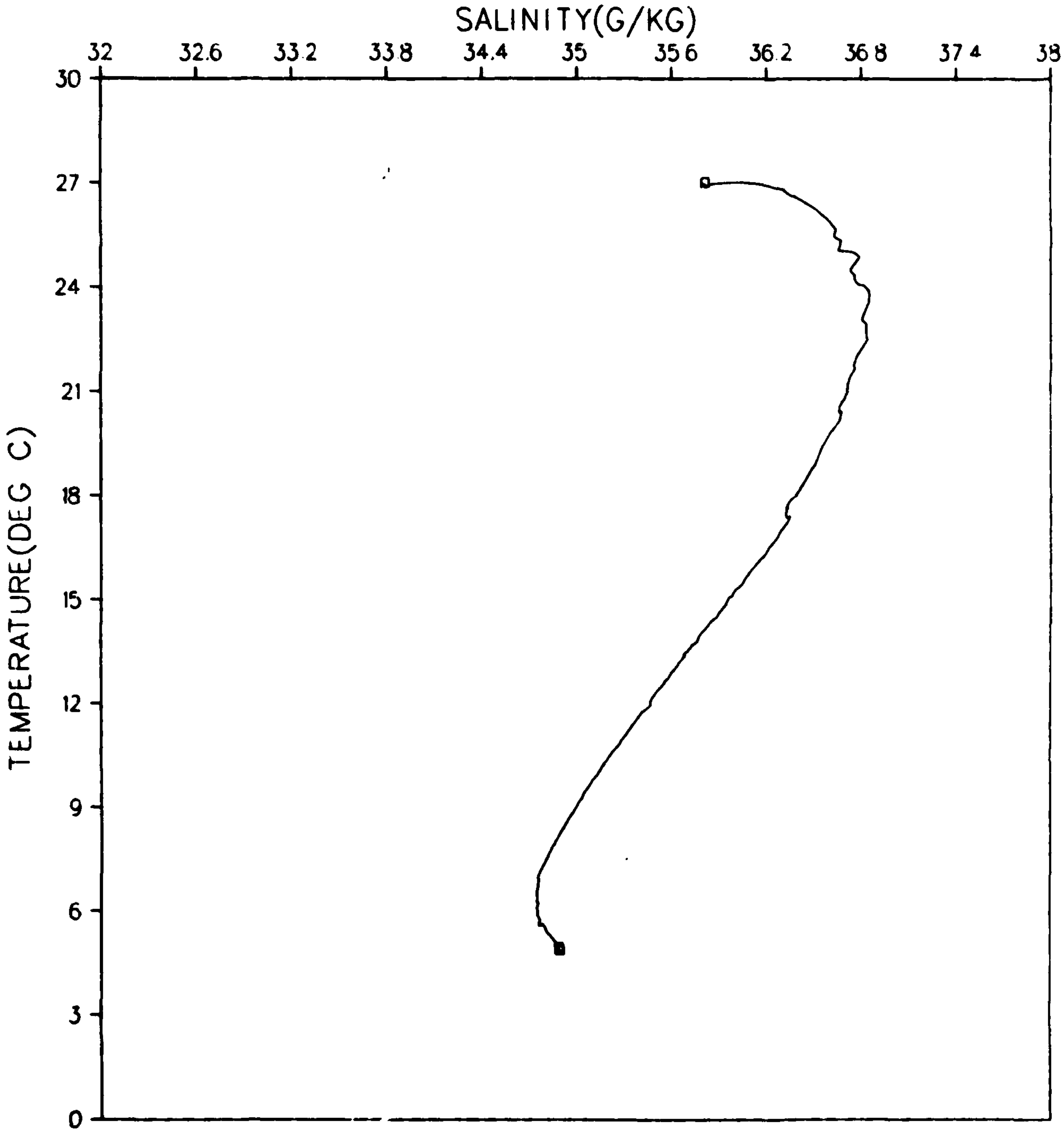


Figure 142.

GRENADA BASIN
STATION 068001
JANUARY 1980

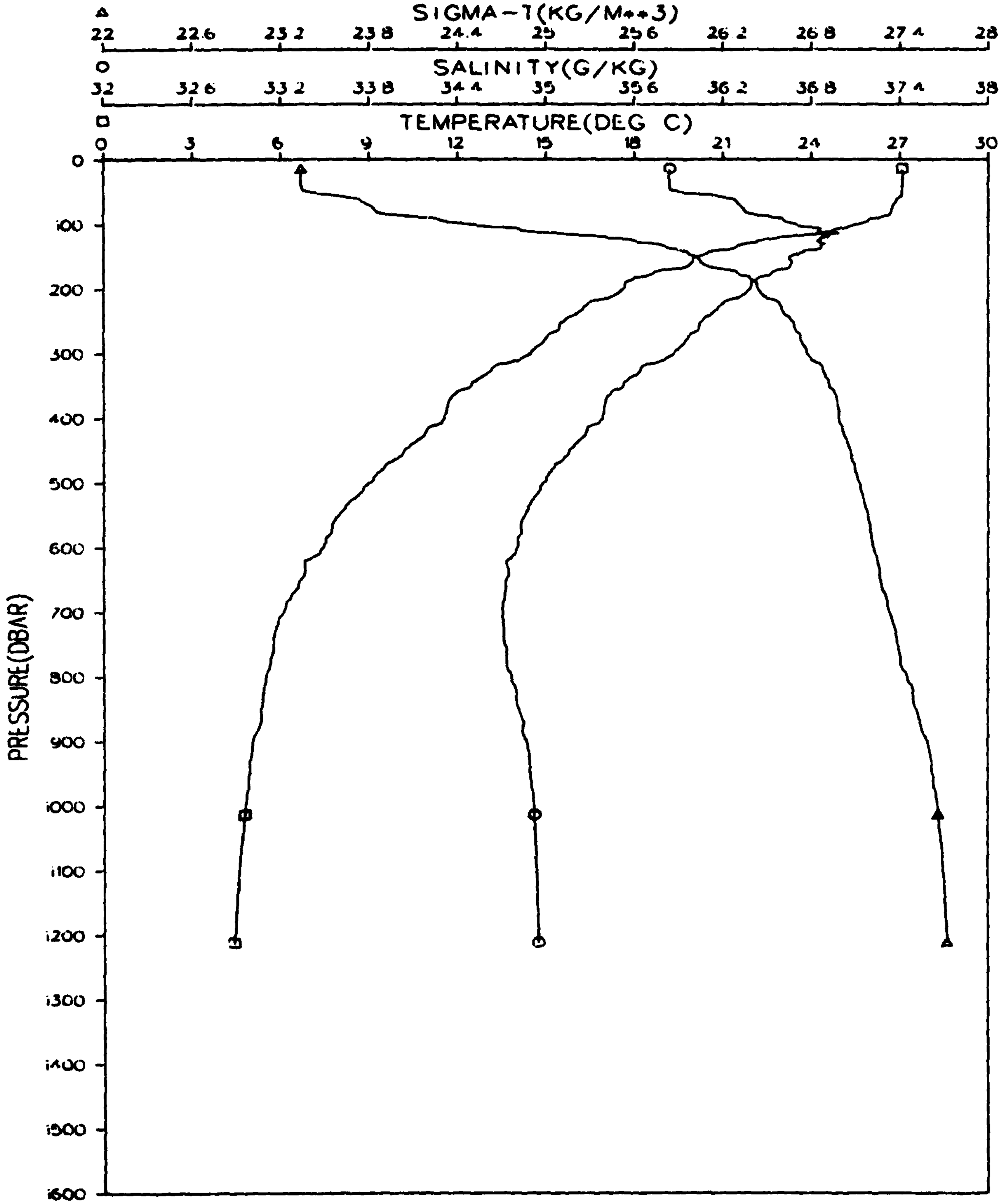


Figure 143.

GRENADA BASIN
STATION 068001
JANUARY 1980

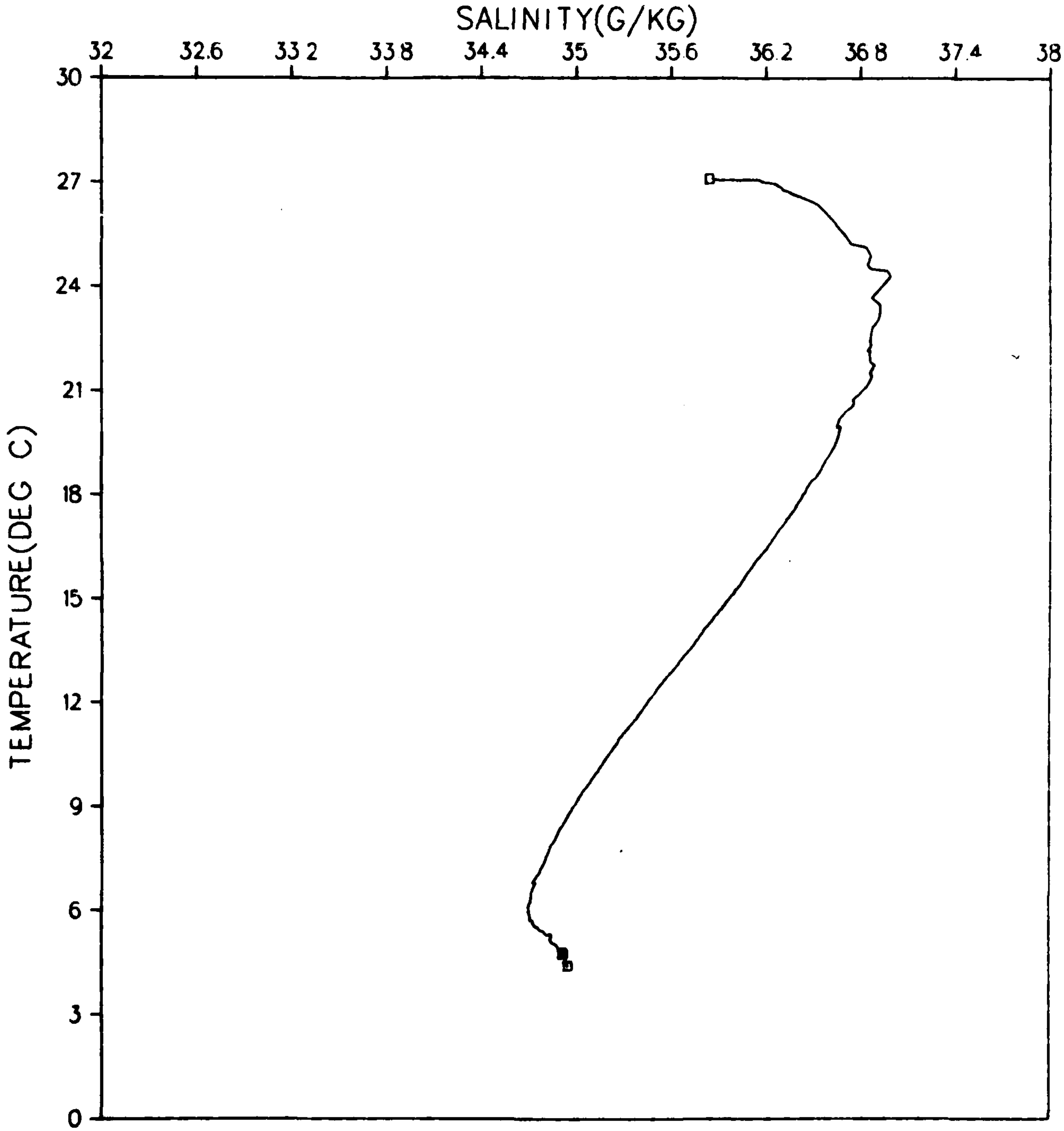


Figure 144.

GRENADA BASIN
STATION 069001
JANUARY 1980

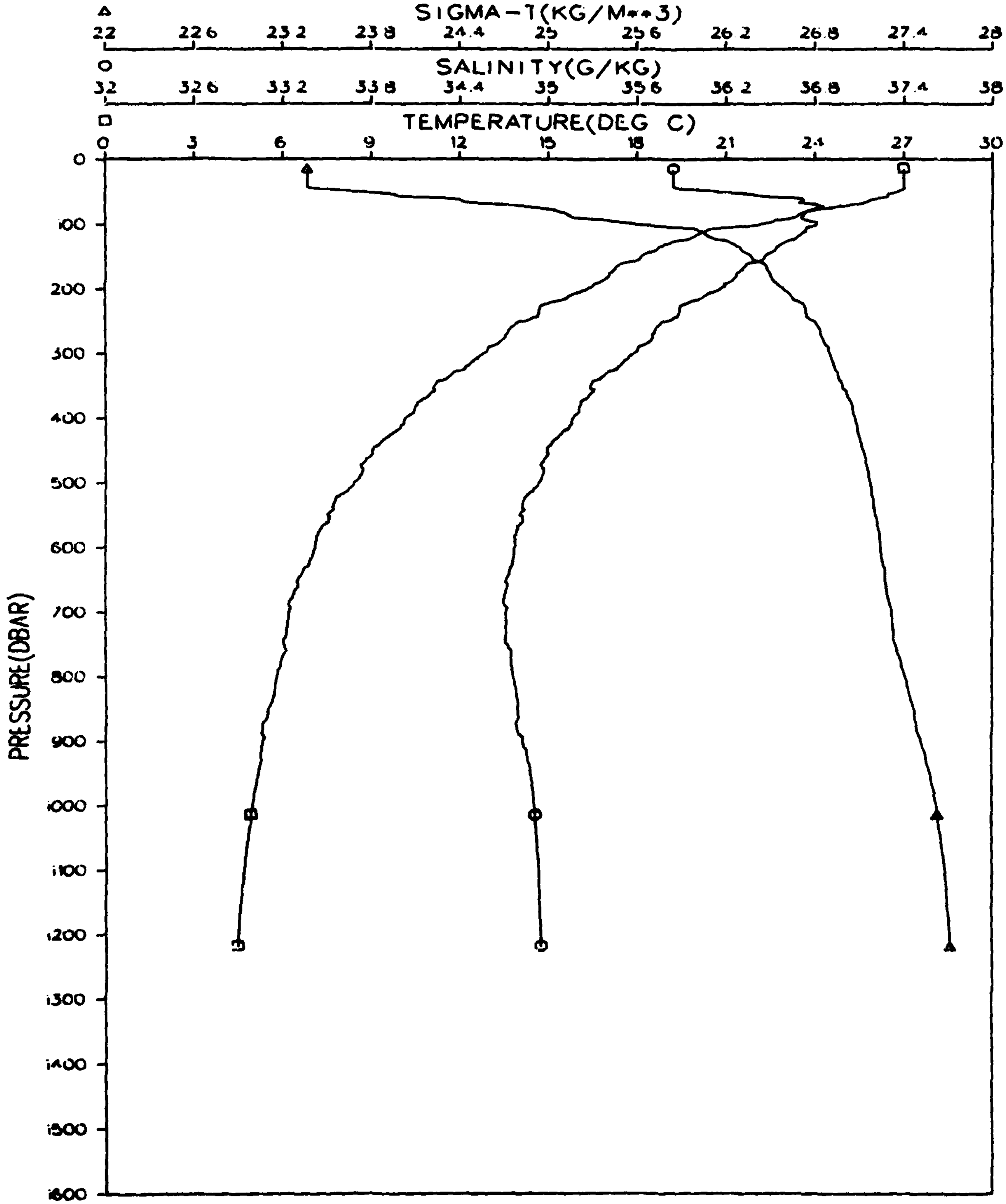


Figure 145.

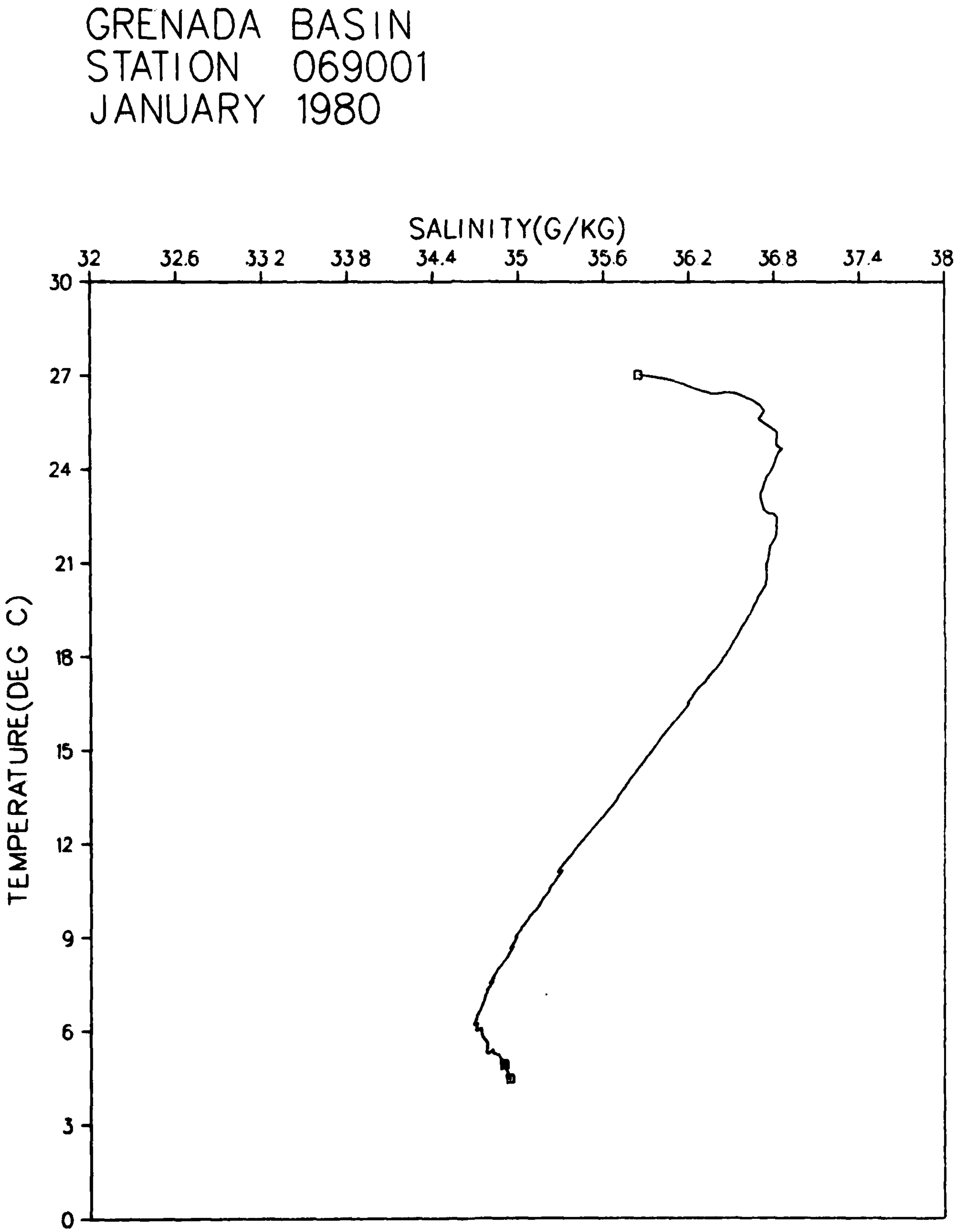
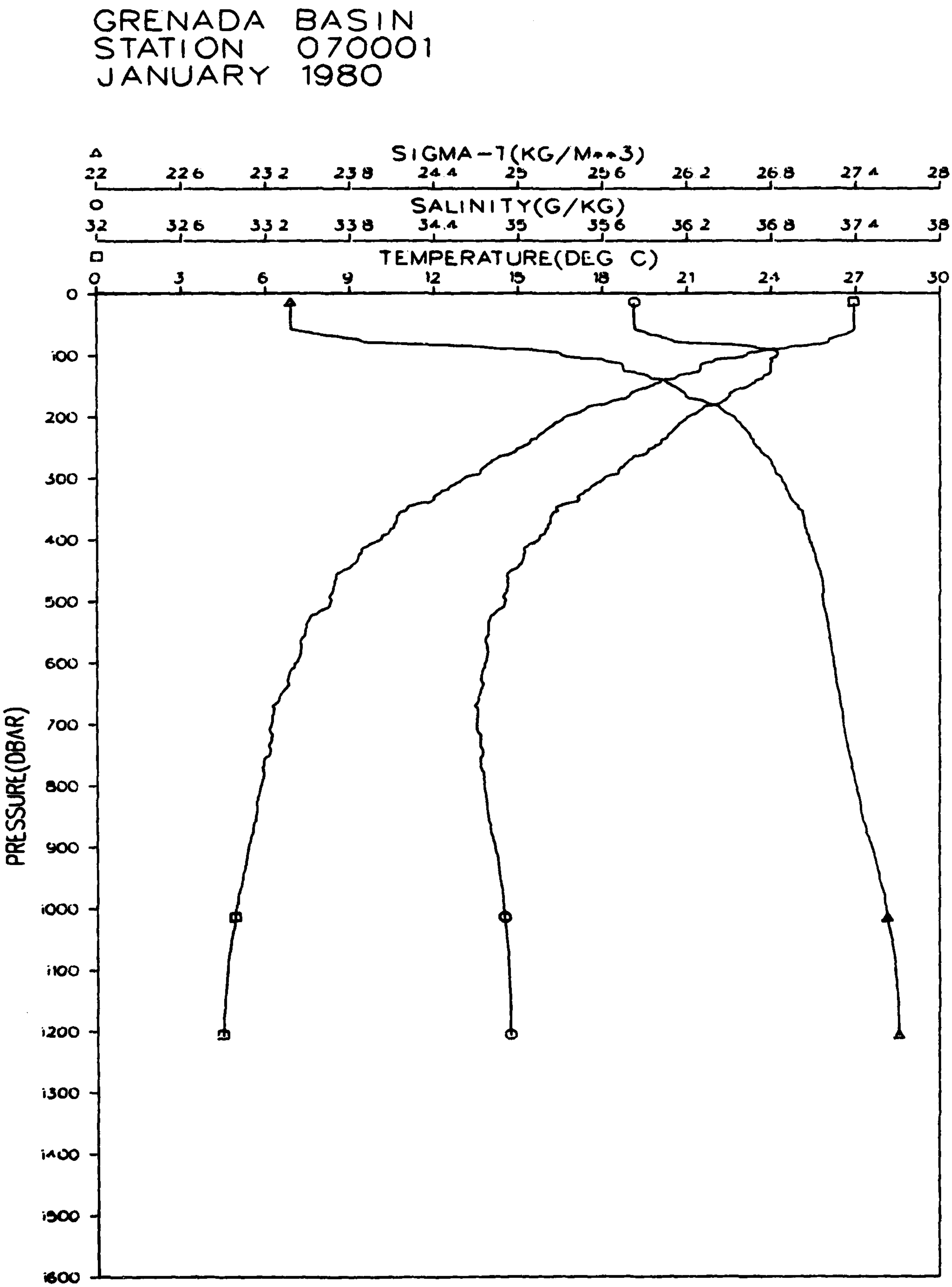

GRENADA BASIN
STATION 069001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 146.



GRENADA BASIN
STATION 070001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 147.

GRENADA BASIN
STATION 070001
JANUARY 1980

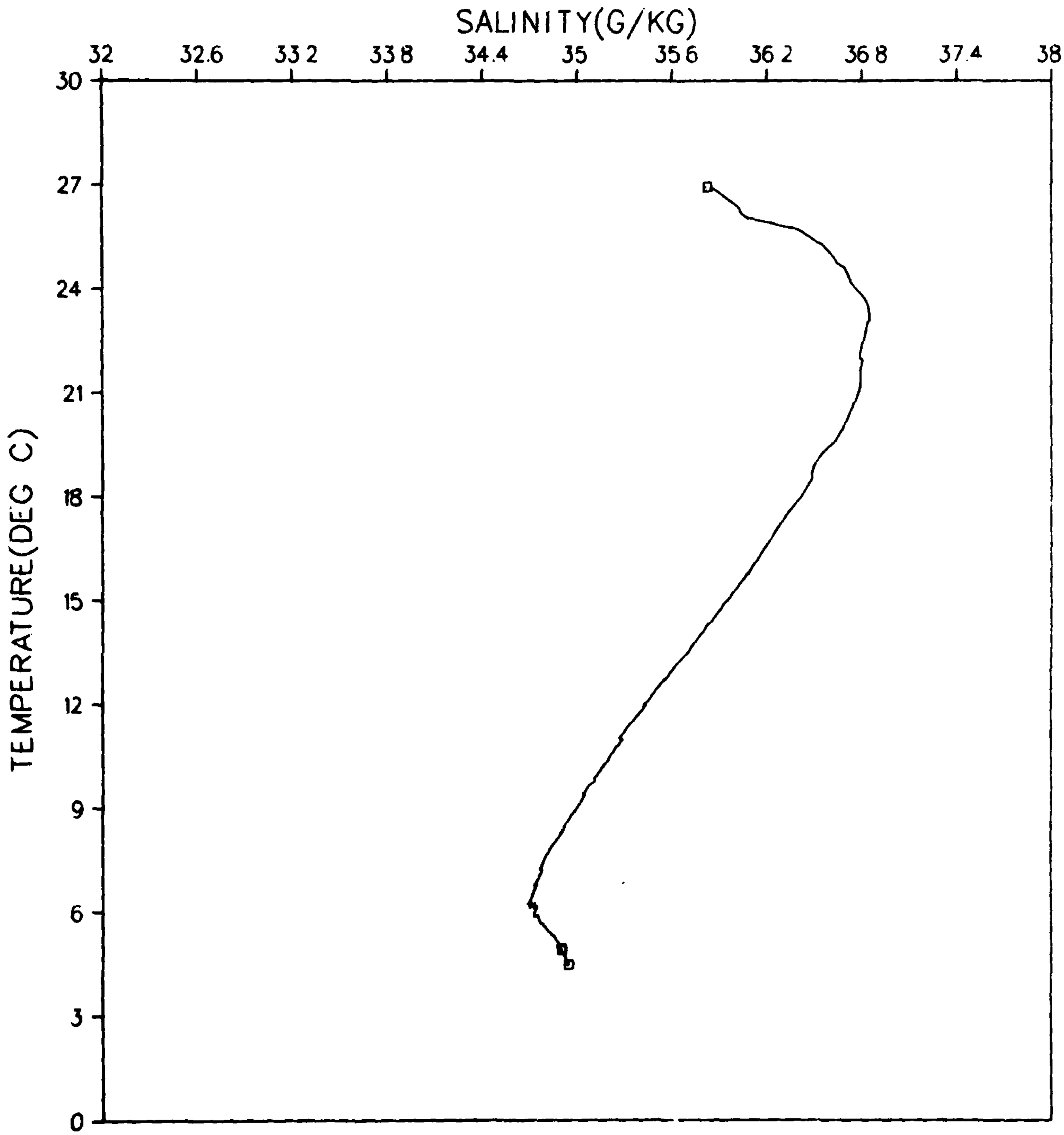


Figure 148.

GRENADA BASIN
STATION 071001
JANUARY 1980

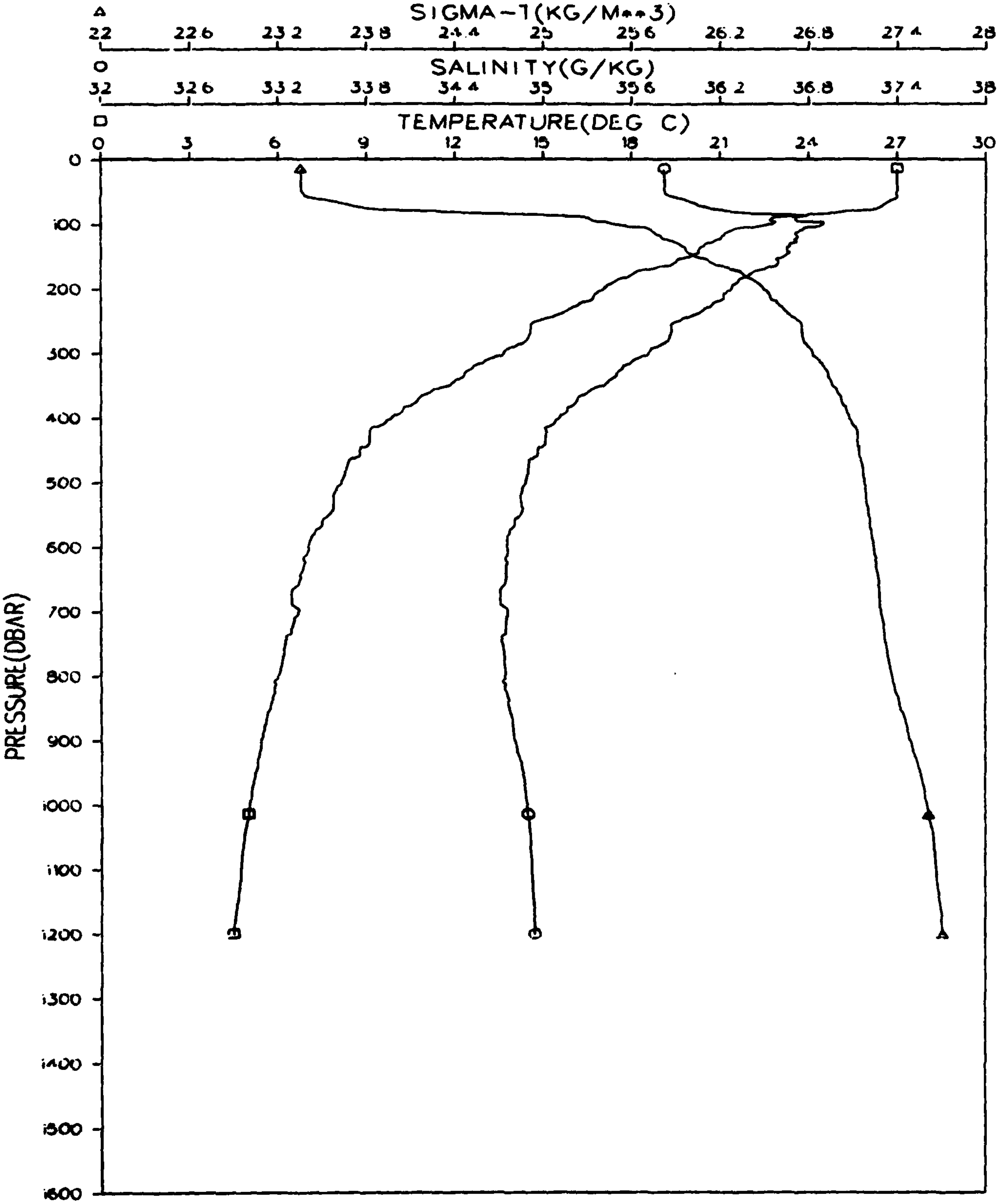


Figure 149.

GRENADA BASIN
STATION 071001
JANUARY 1980

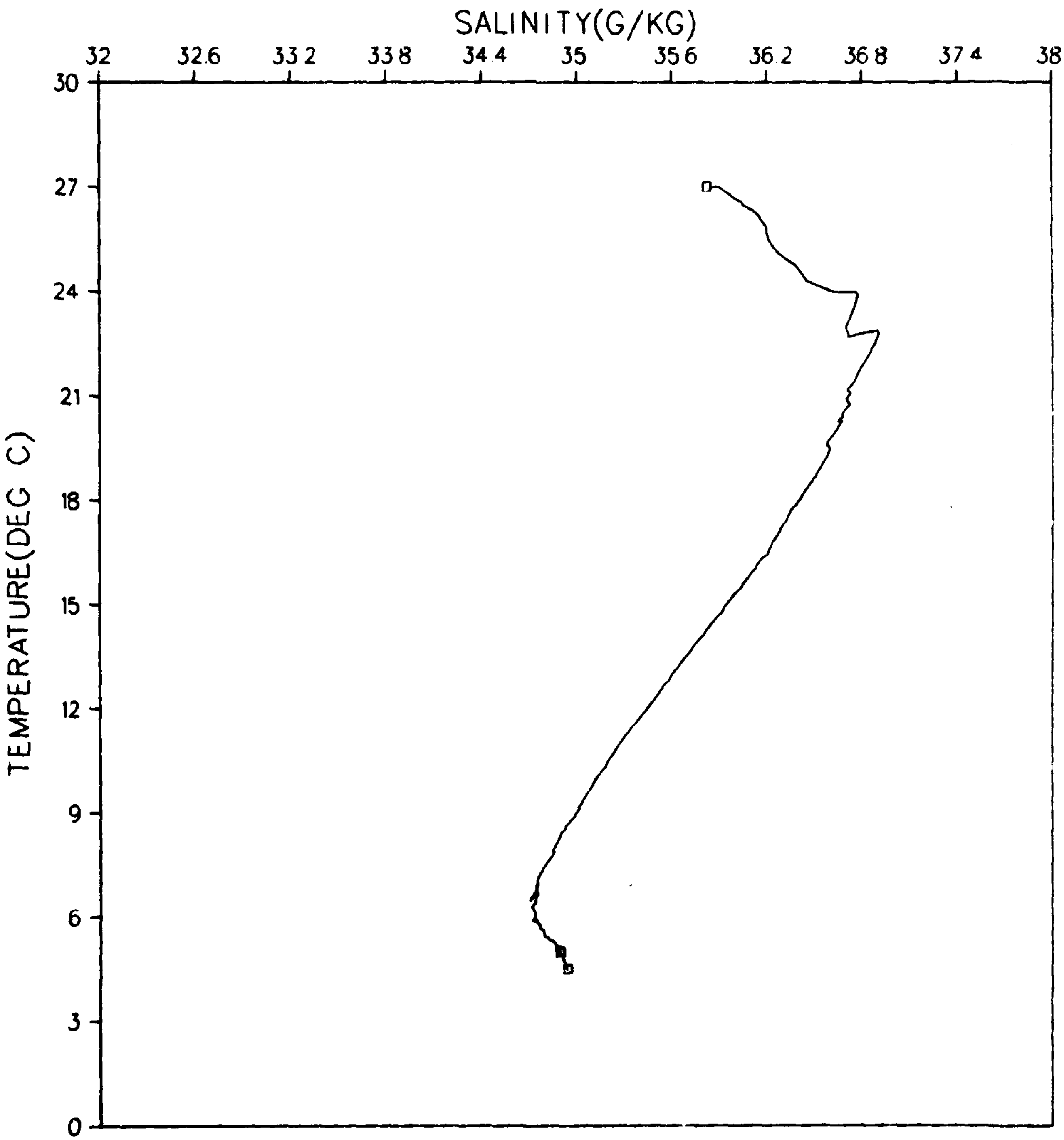


Figure 150.

GRENADA BASIN
STATION 072001
JANUARY 1980

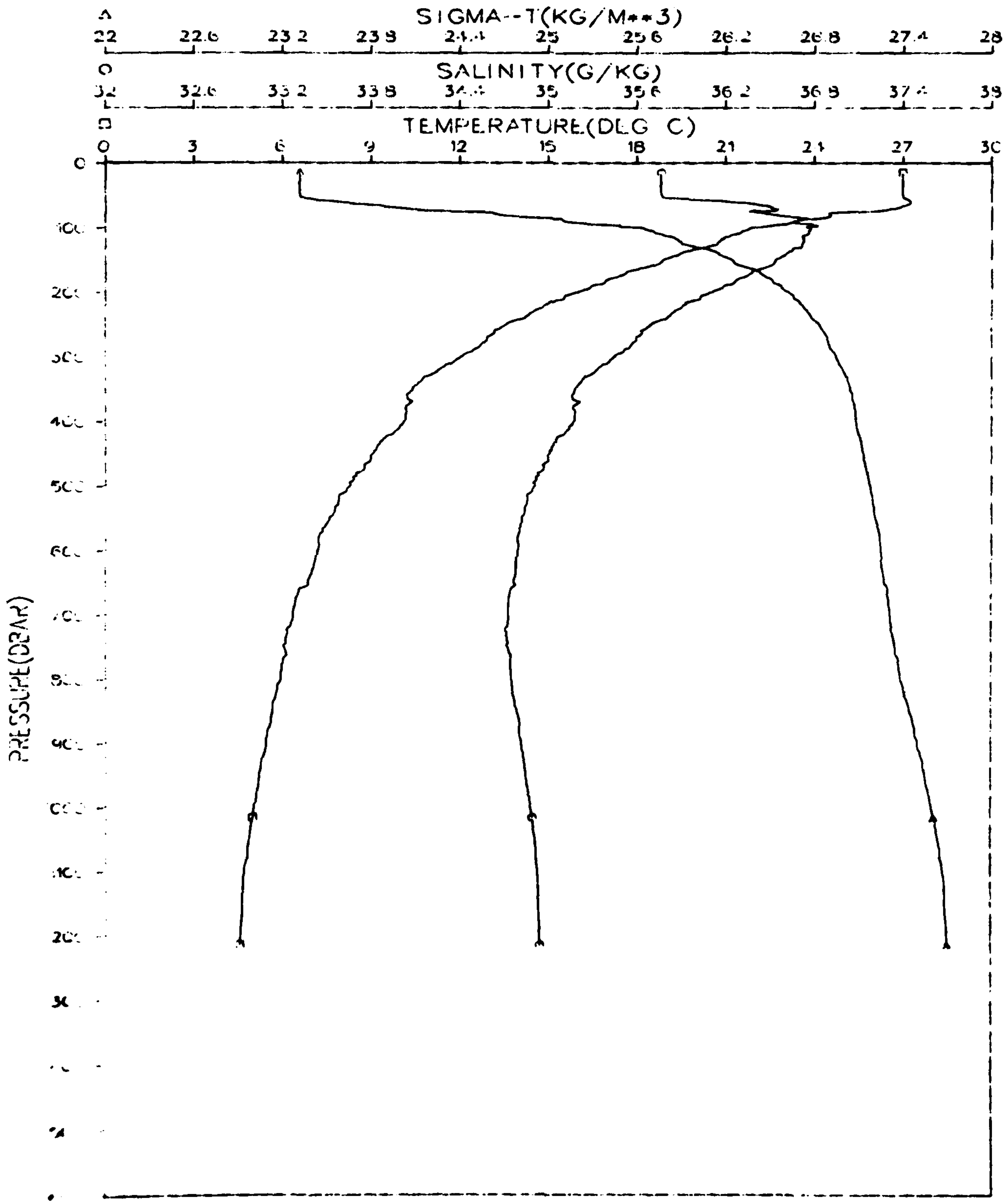


Figure 151.

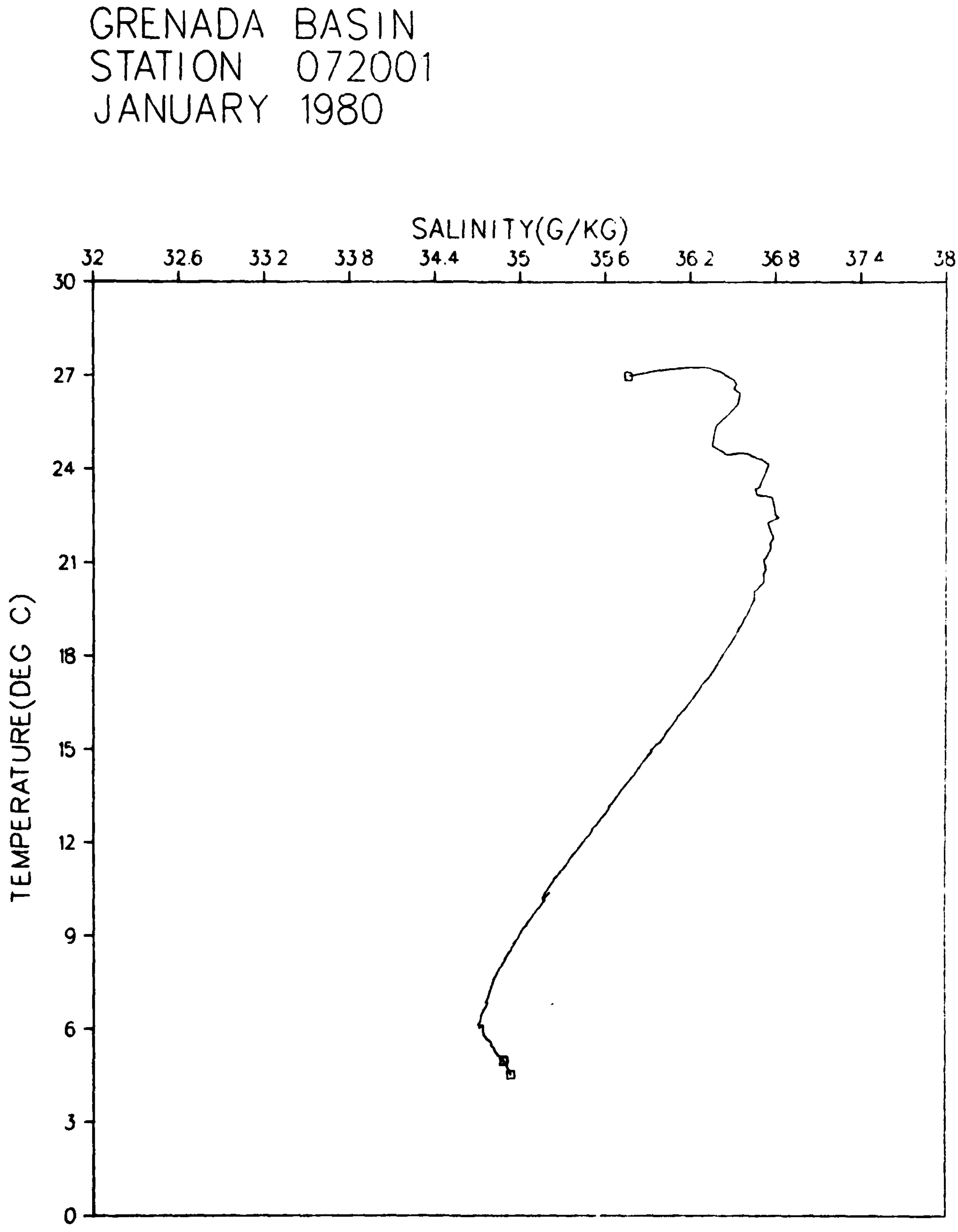

GRENADA BASIN
STATION 072001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 152.

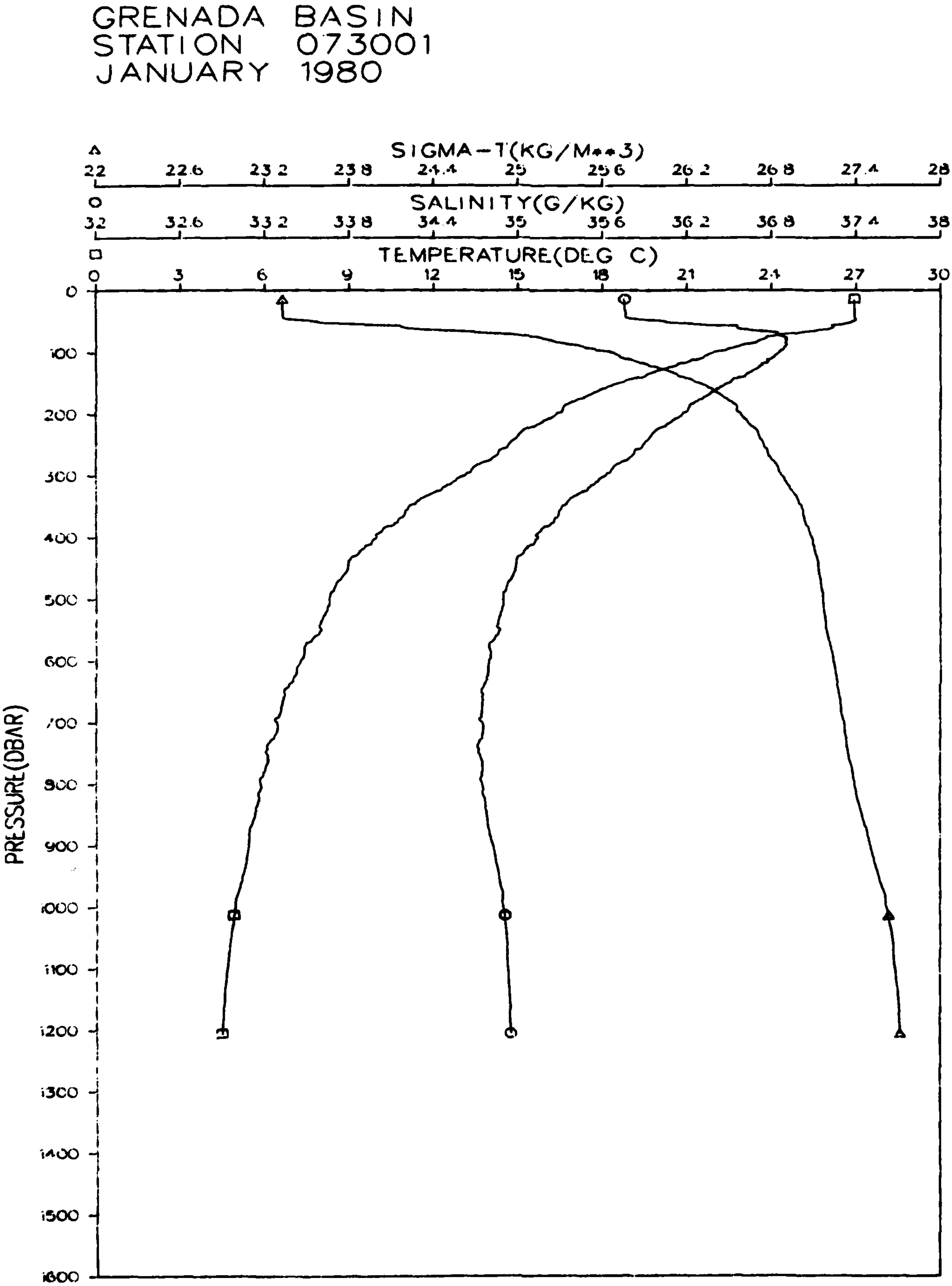
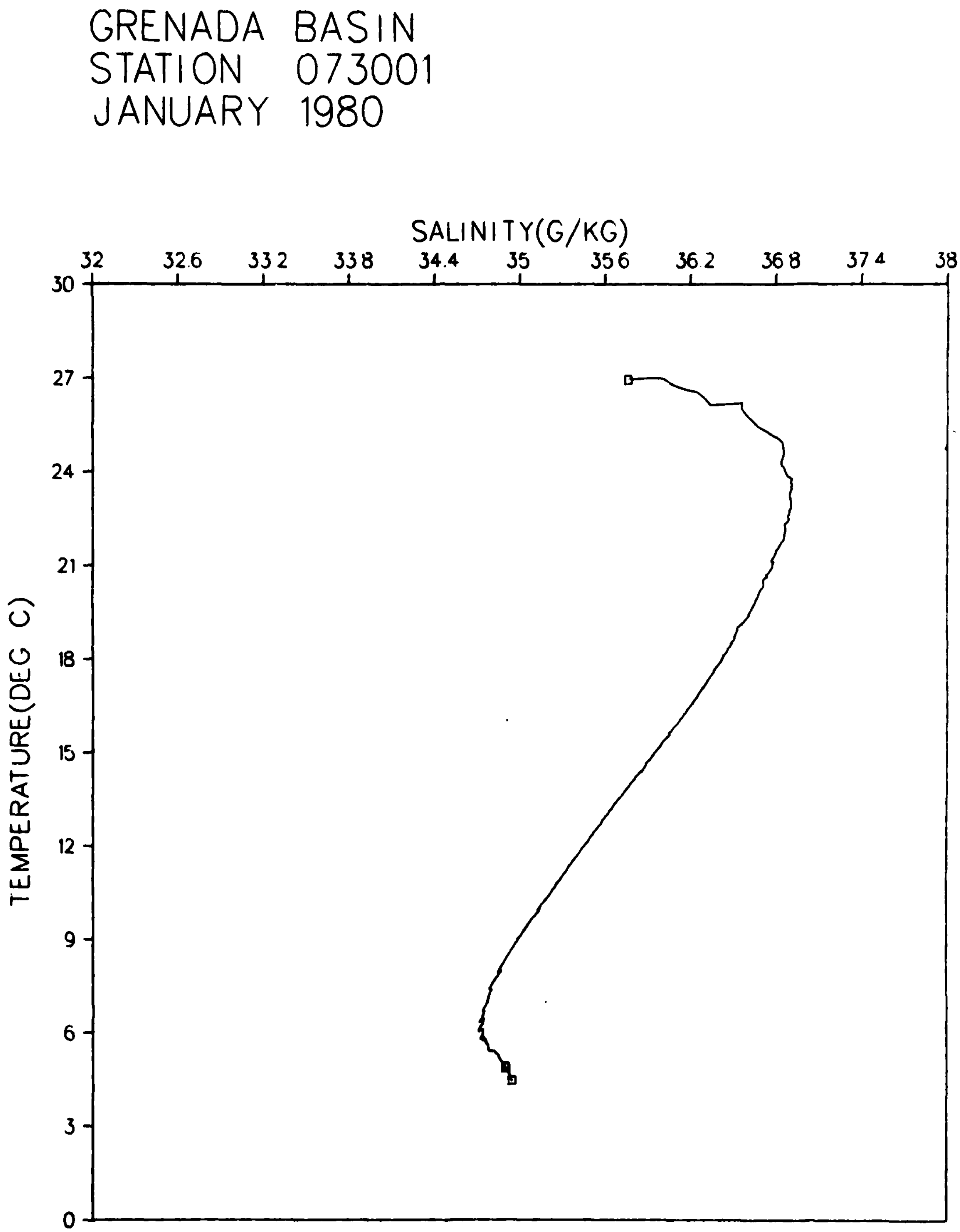

GRENADA BASIN
STATION 073001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 153.



GRENADA BASIN
STATION 073001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 154.

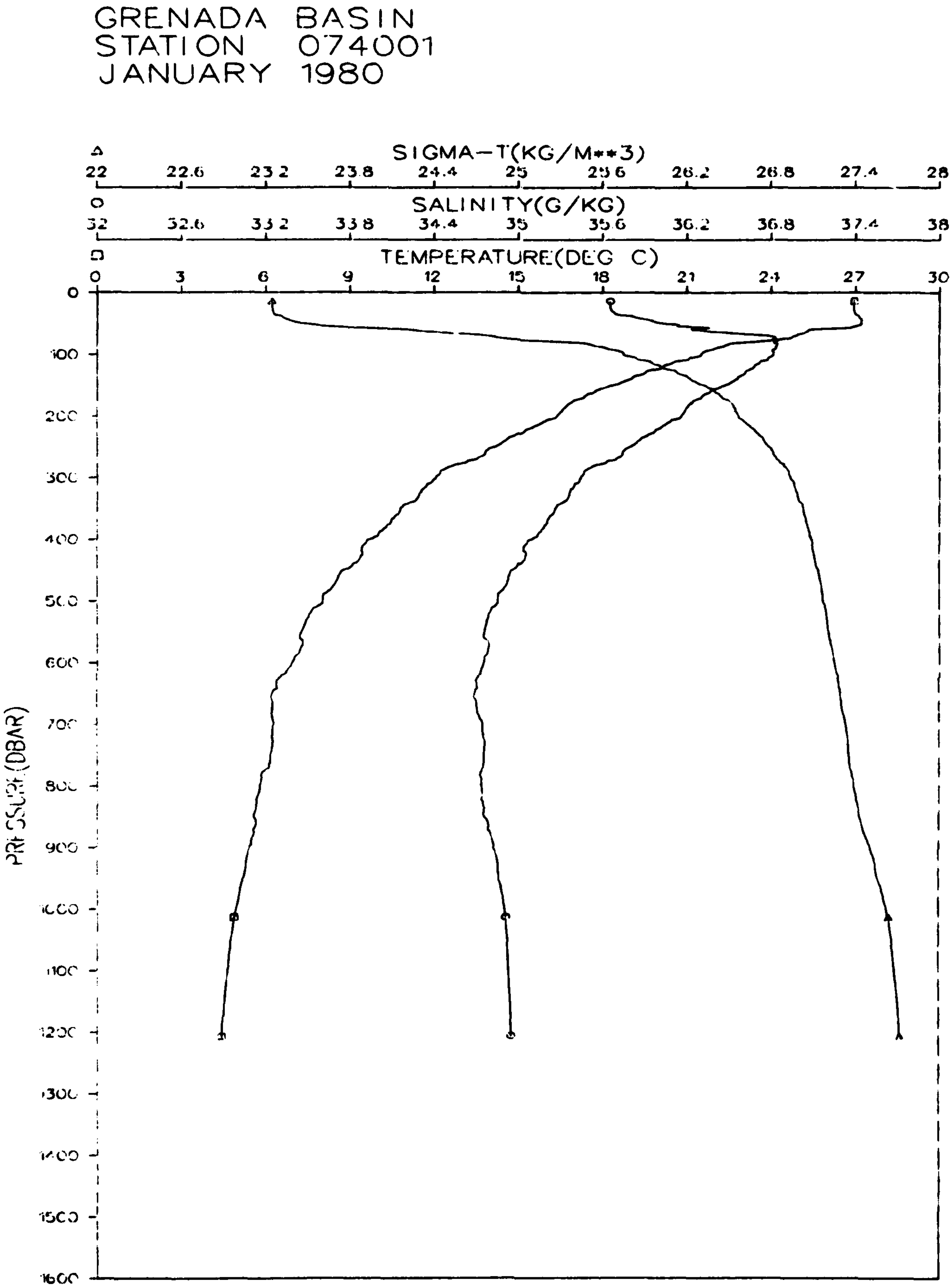

GRENADA BASIN
STATION 074001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 155.

GRENADA BASIN
STATION 074001
JANUARY 1980

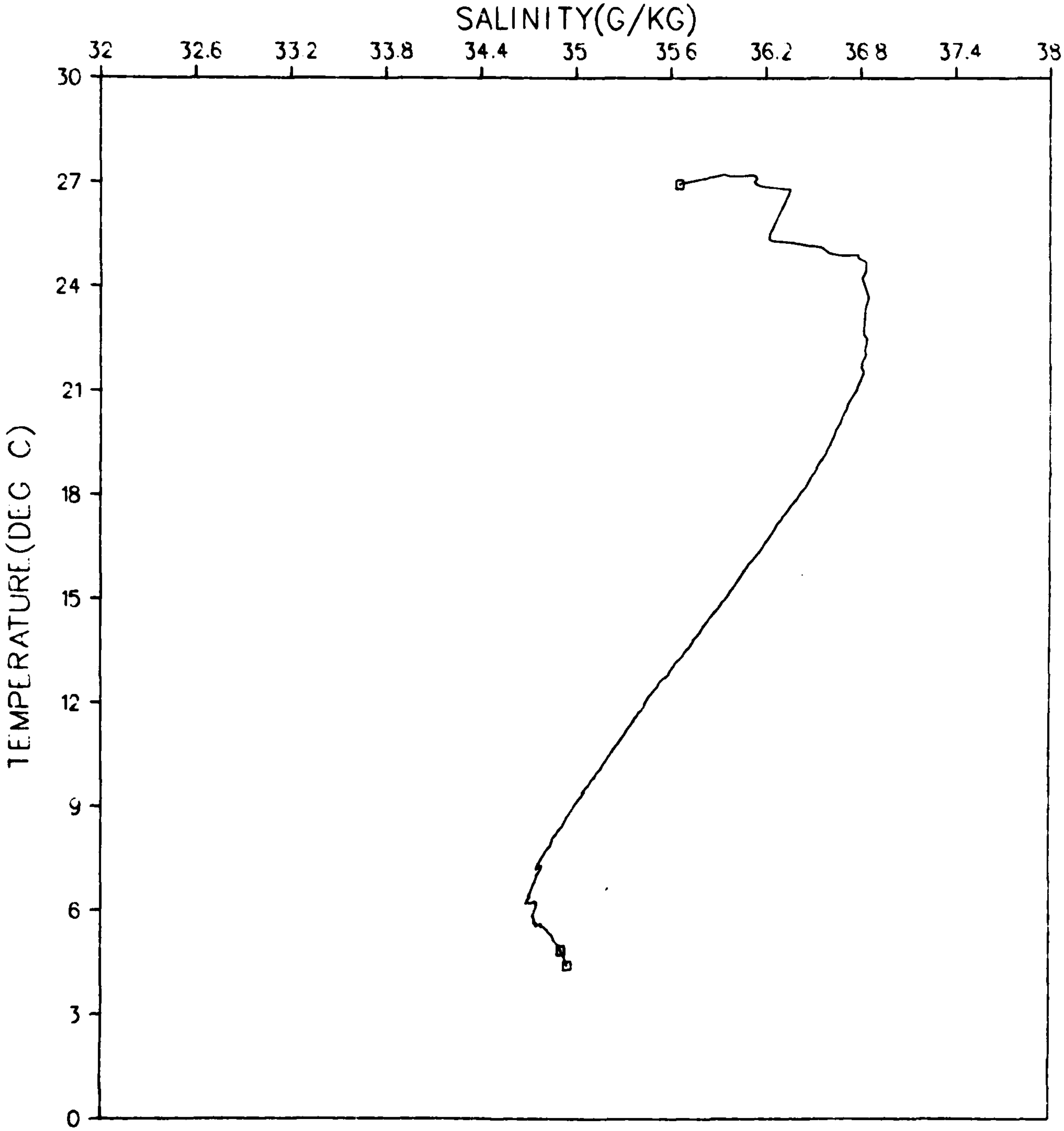


Figure 156.

GRENADA BASIN
STATION 075001
JANUARY 1980

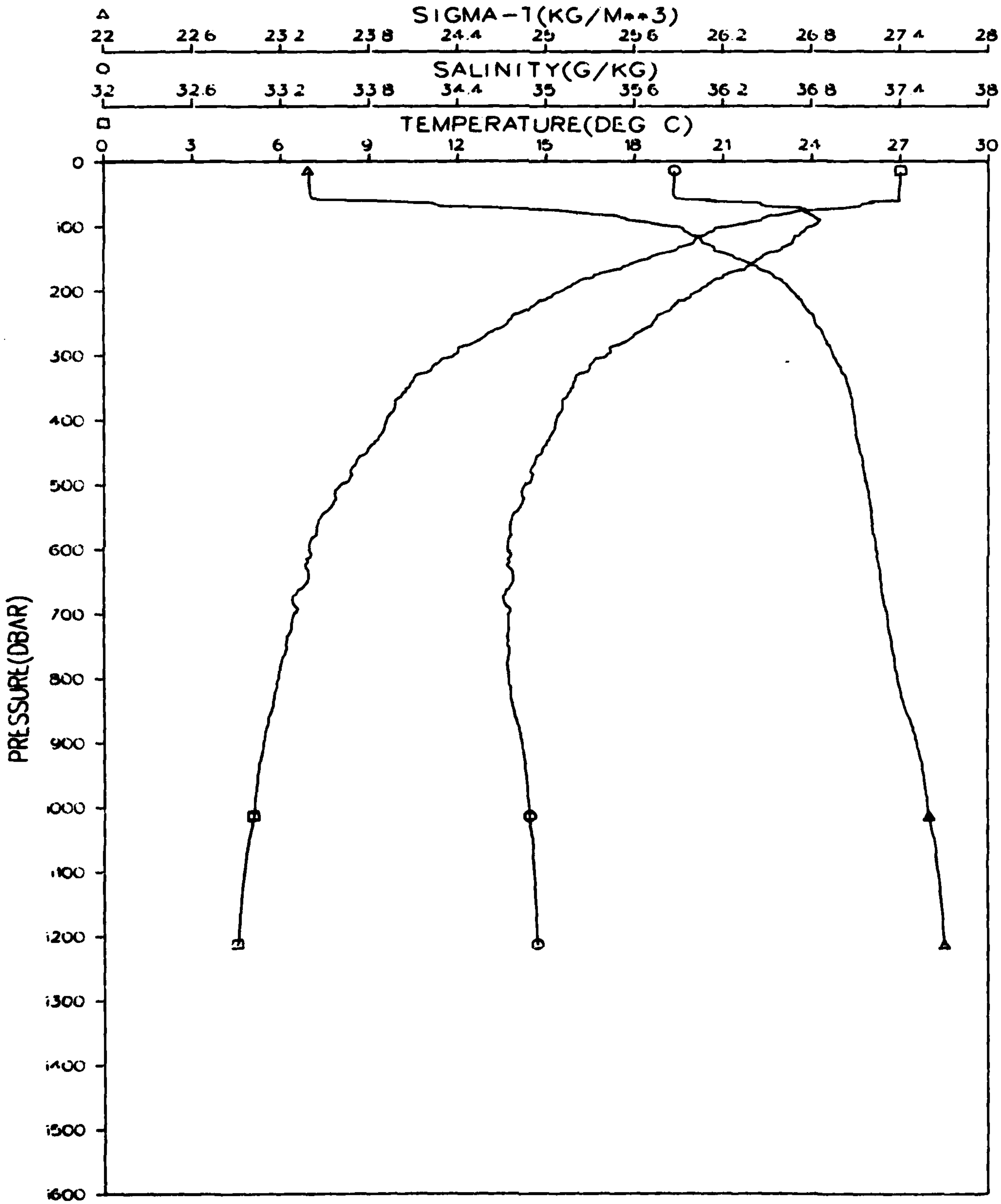
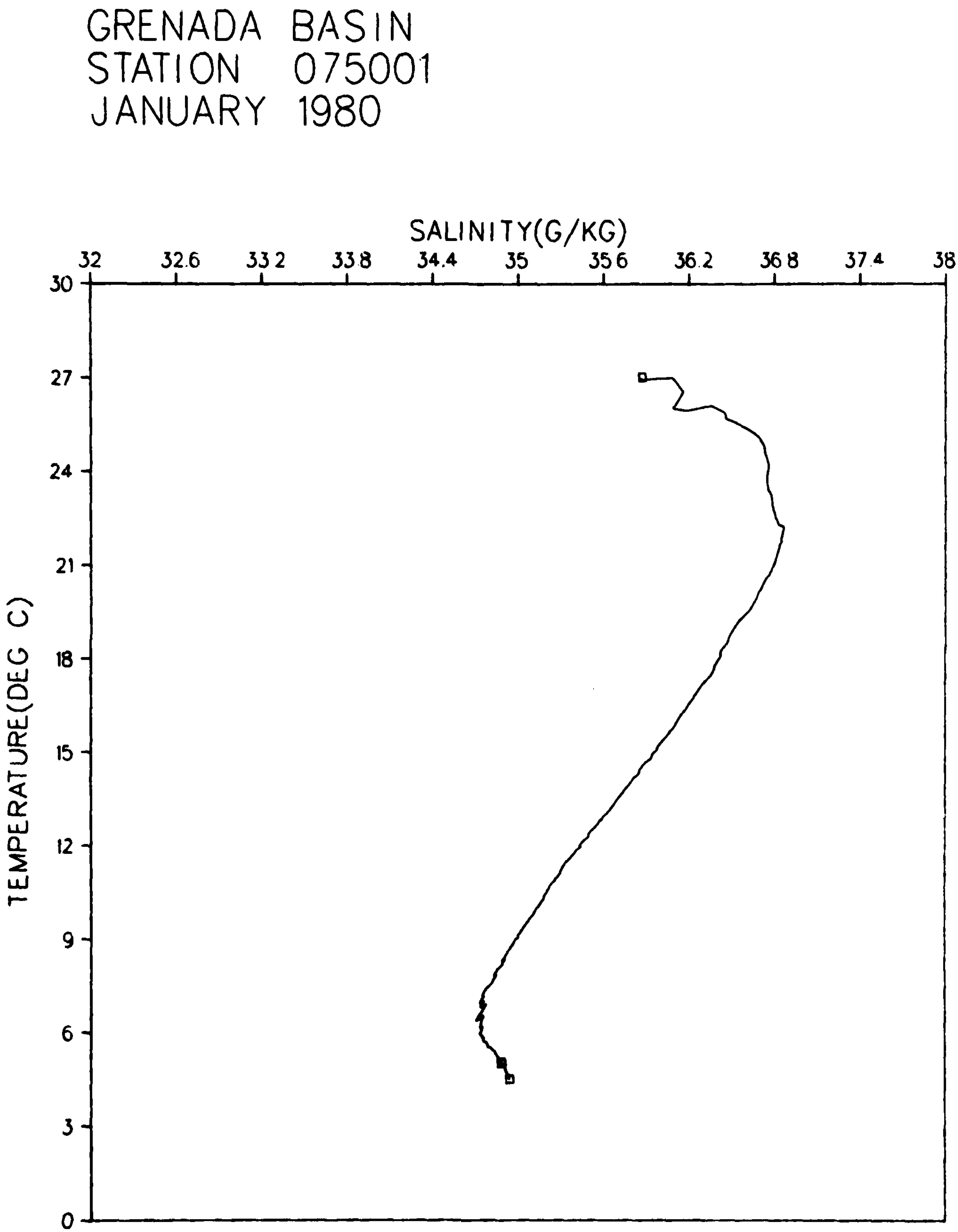


Figure 157.



GRENADA BASIN
STATION 075001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 158.

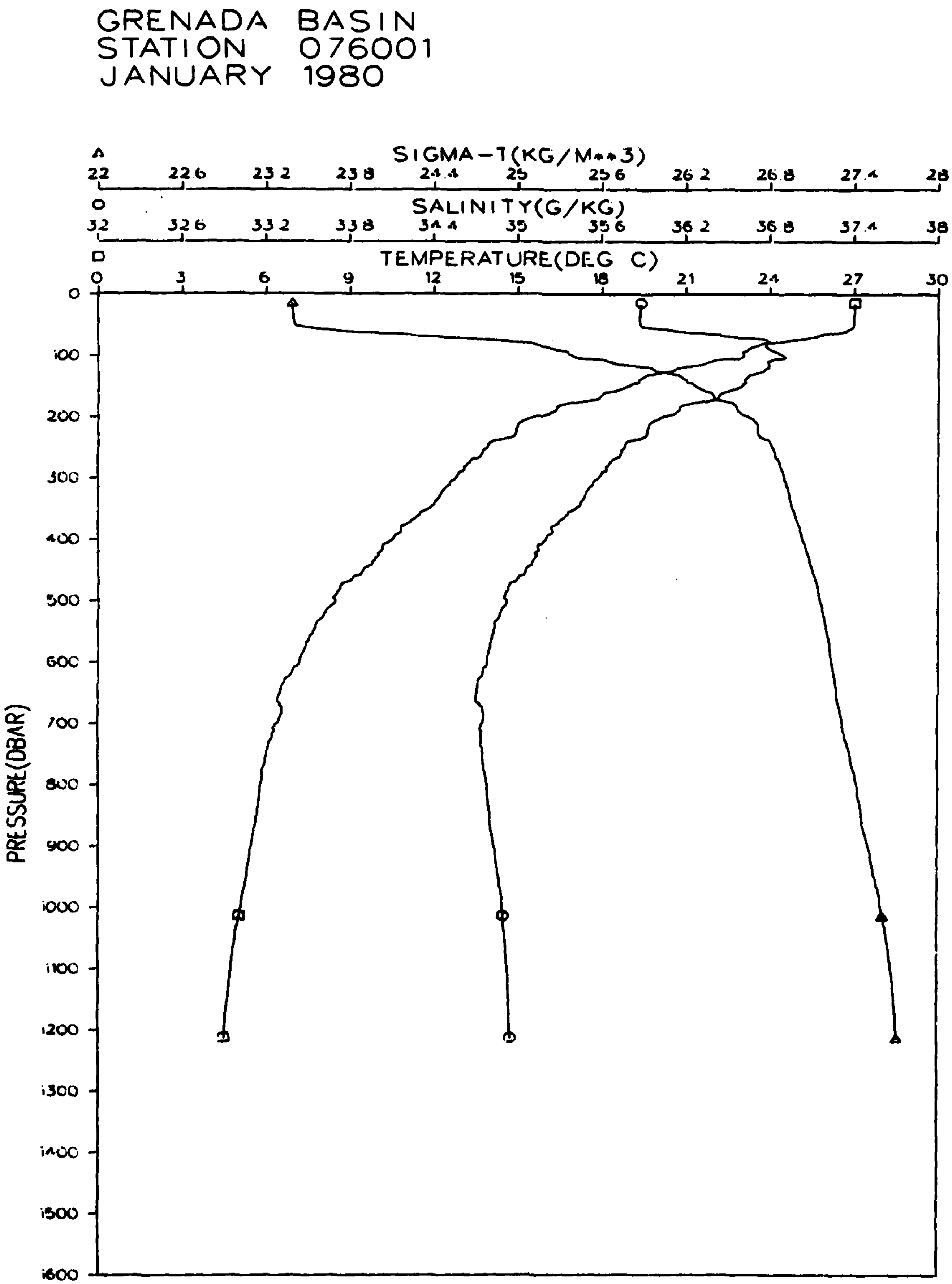

GRENADA BASIN
STATION 076001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 159.

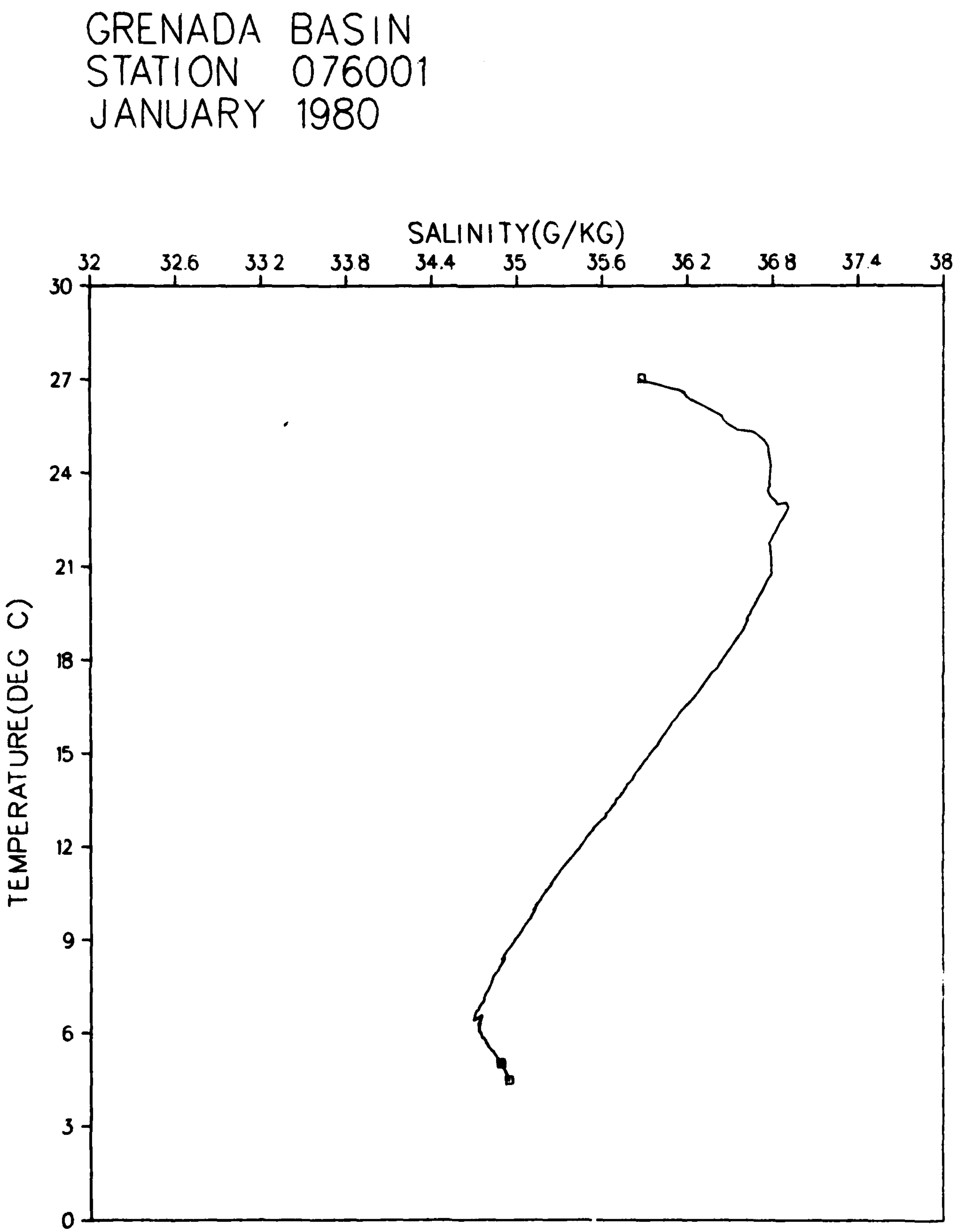
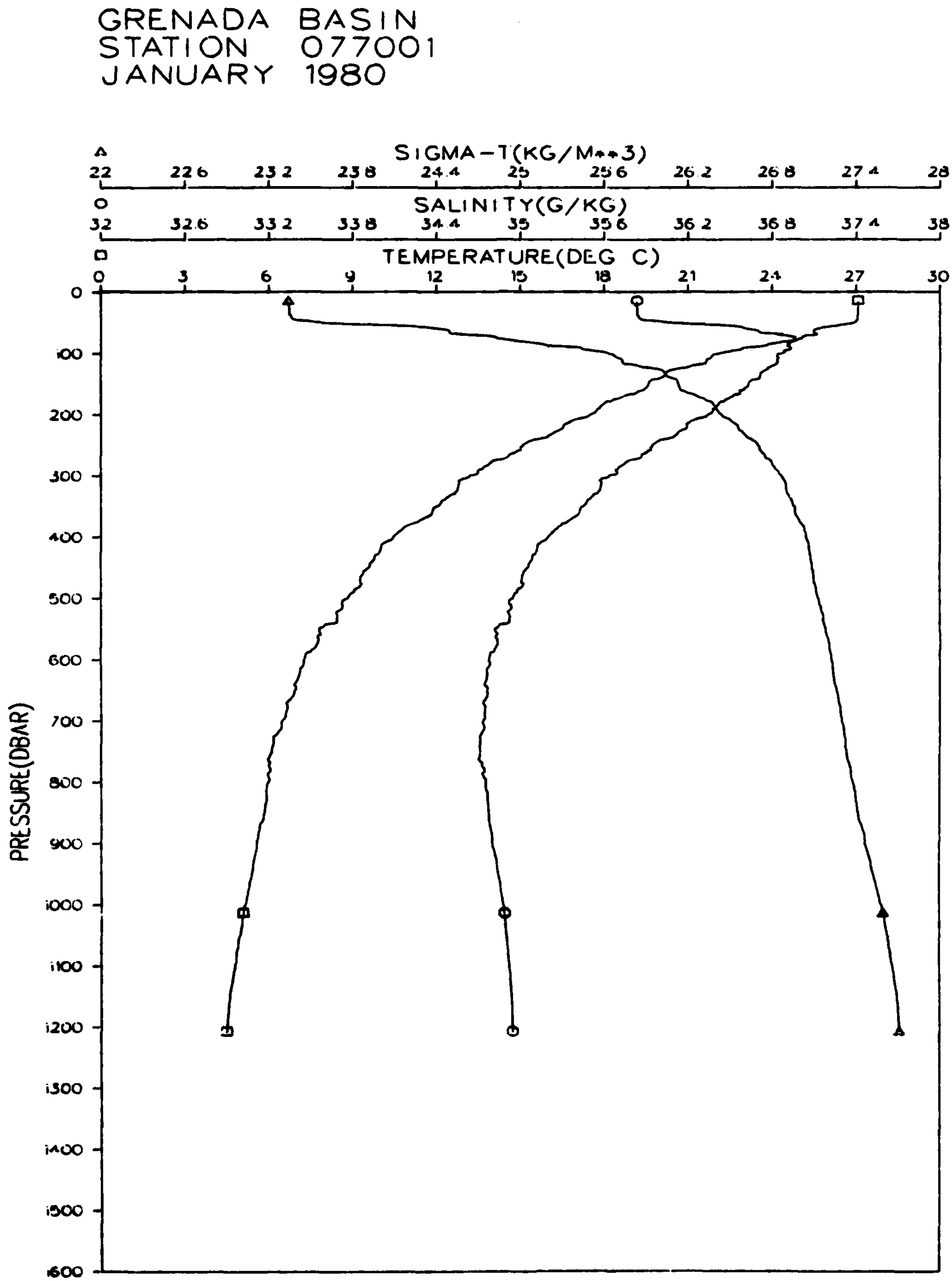

GRENADA BASIN
STATION 076001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 160.



GRENADA BASIN
STATION 077001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 161.

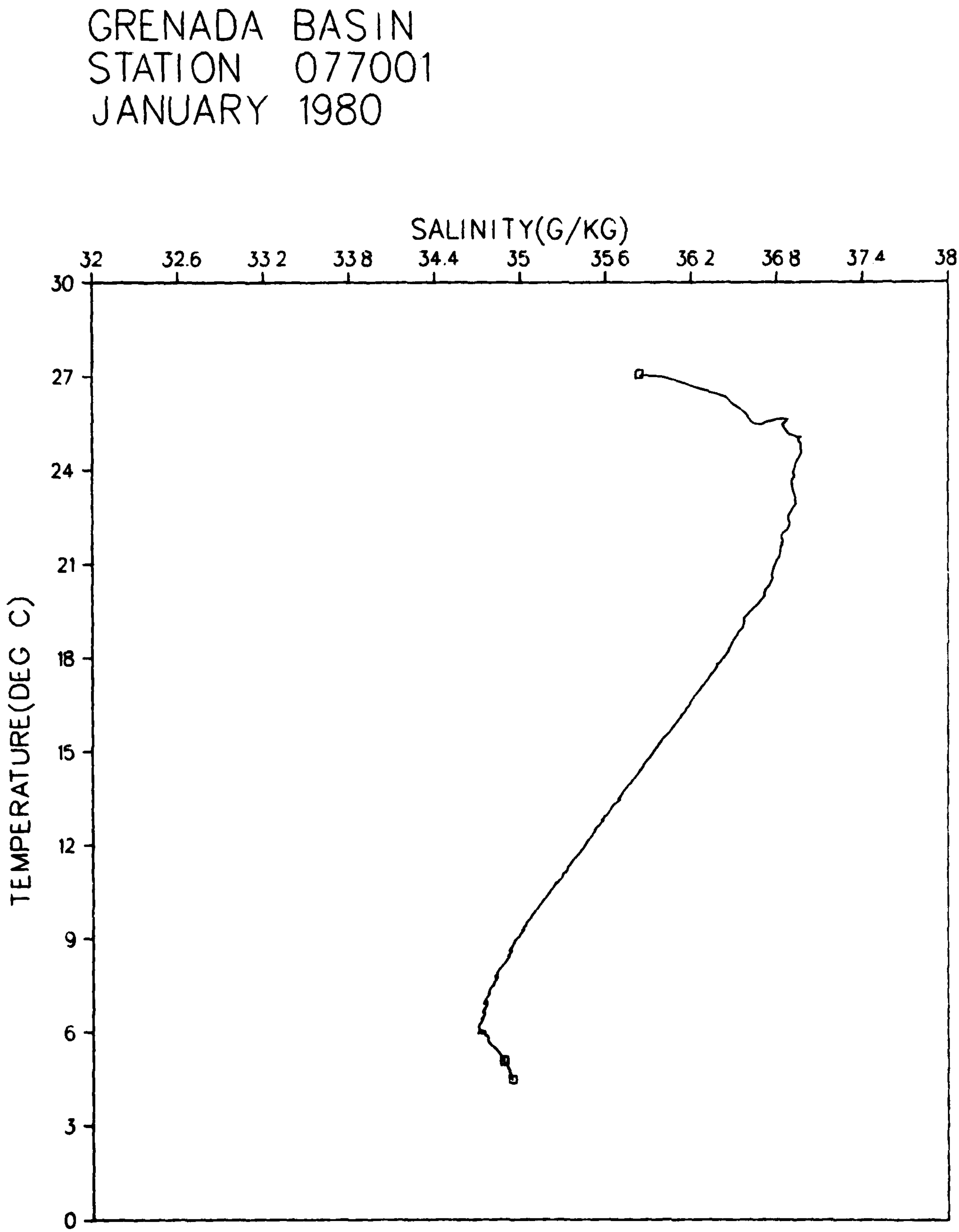

GRENADA BASIN
STATION 077001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 162.

GRENADA BASIN
STATION 078001
JANUARY 1980

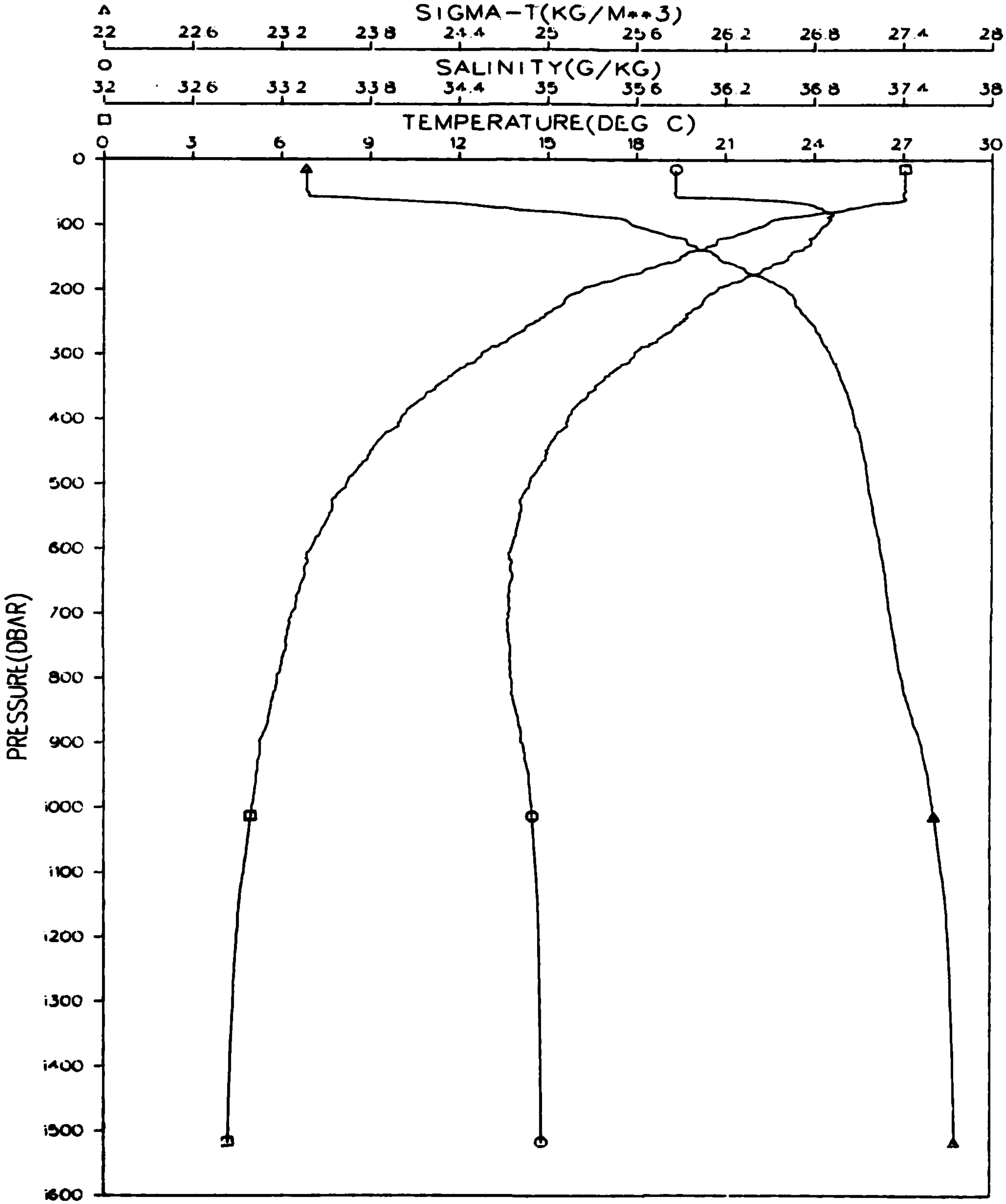


Figure 163.

GRENADA BASIN
STATION 078001
JANUARY 1980

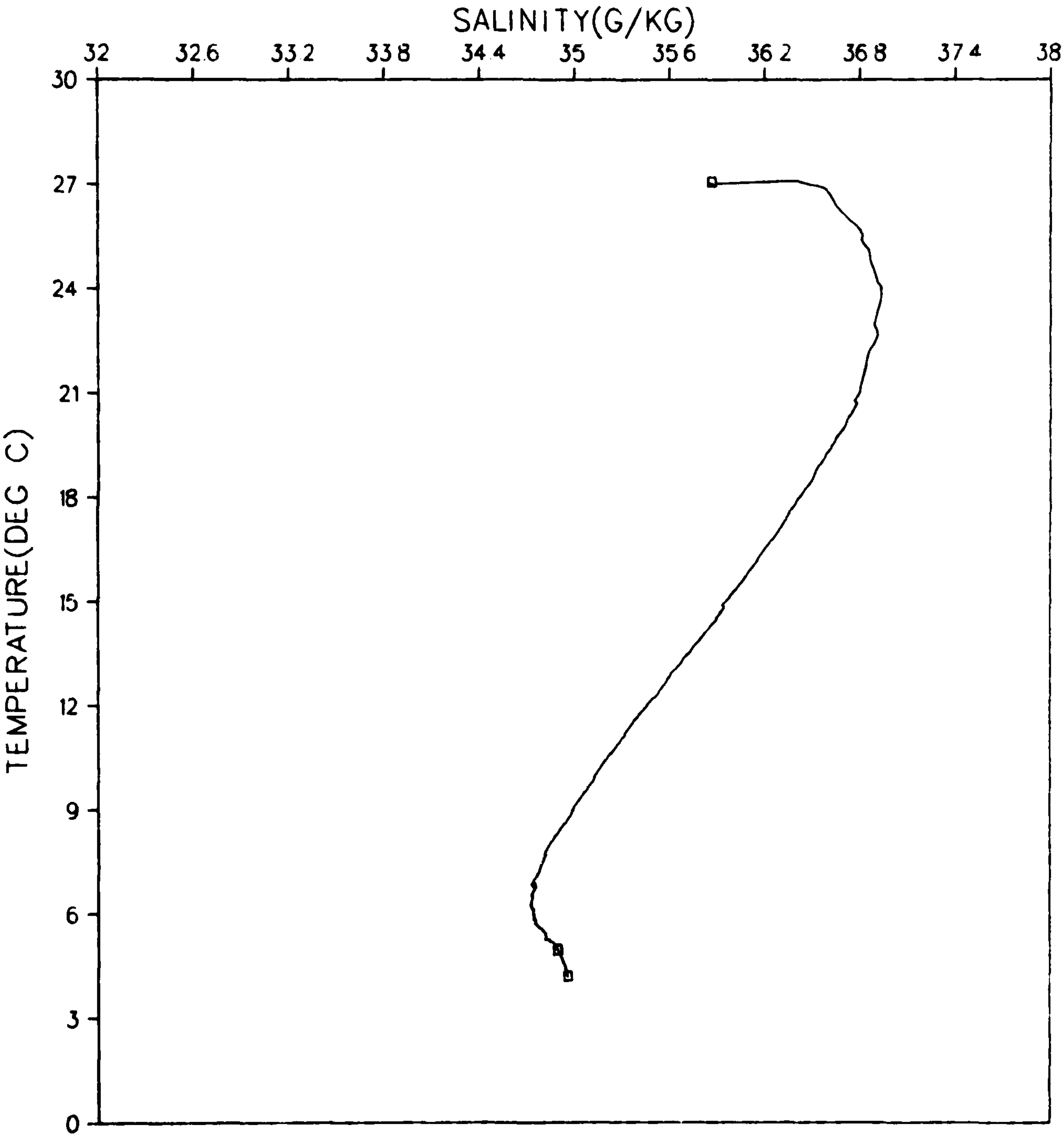


Figure 164.

AD-A103 960 NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY NSTL S--ETC F/G 8/10
HYDROGRAPHIC MEASUREMENTS IN THE GRENADA BASIN, SOUTHEASTERN CA--ETC(U)
JUN 81 D A BURNS, M A GOVE, N V LOMBARD

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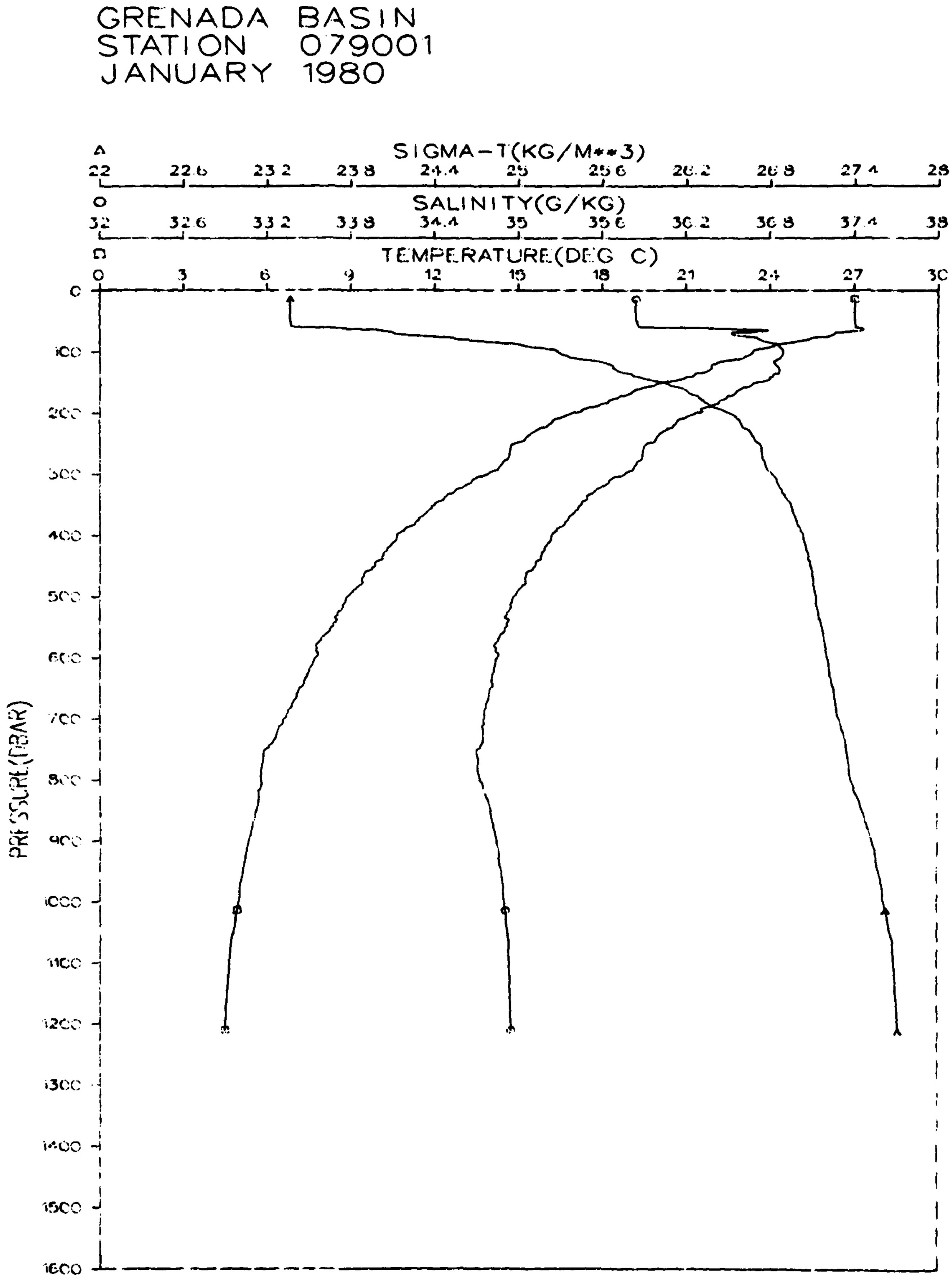

GRENADA BASIN
STATION 079001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 165.

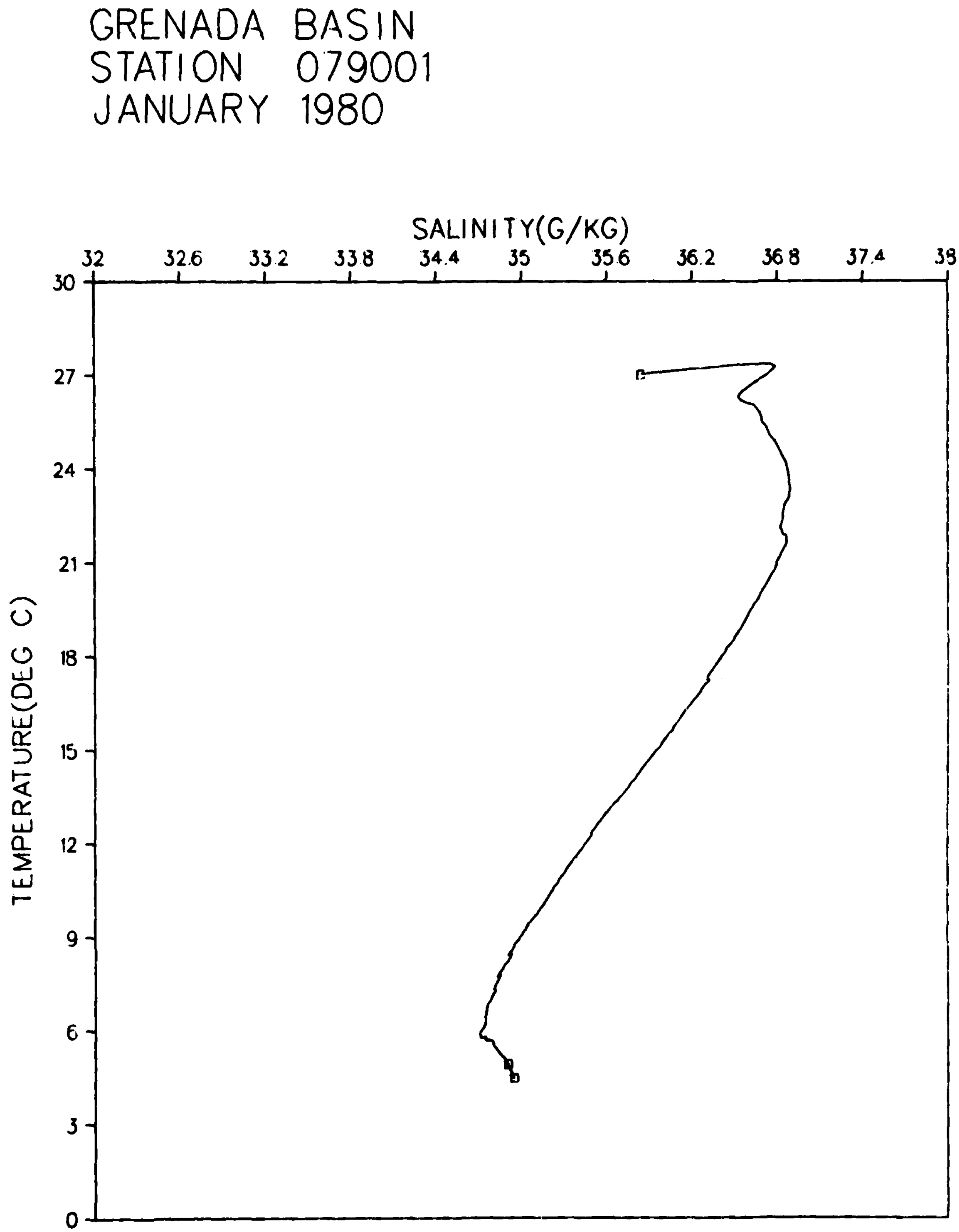

GRENADA BASIN
STATION 079001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 166.

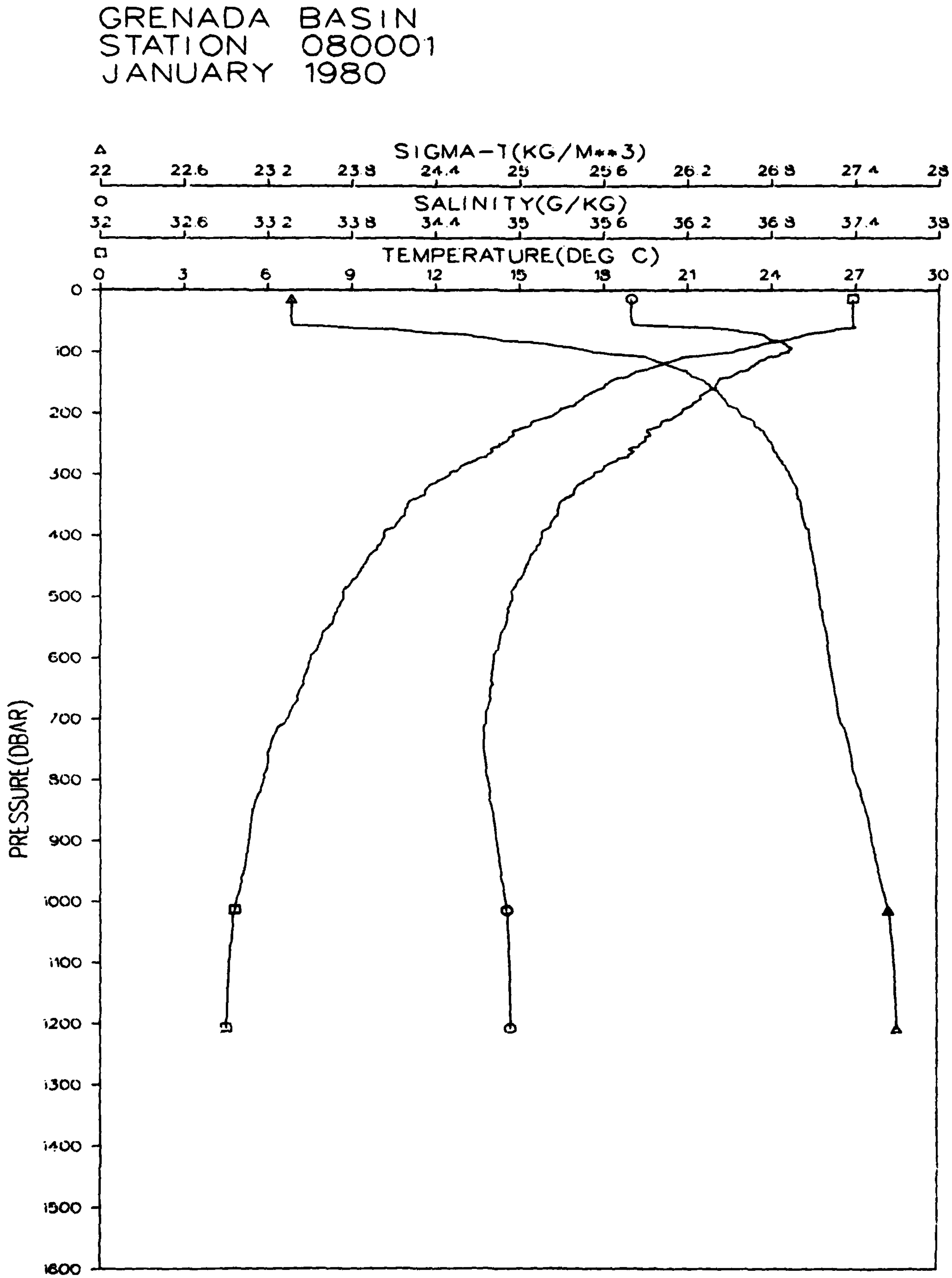

GRENADA BASIN
STATION 080001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 167.

GRENADA BASIN
STATION 080001
JANUARY 1980

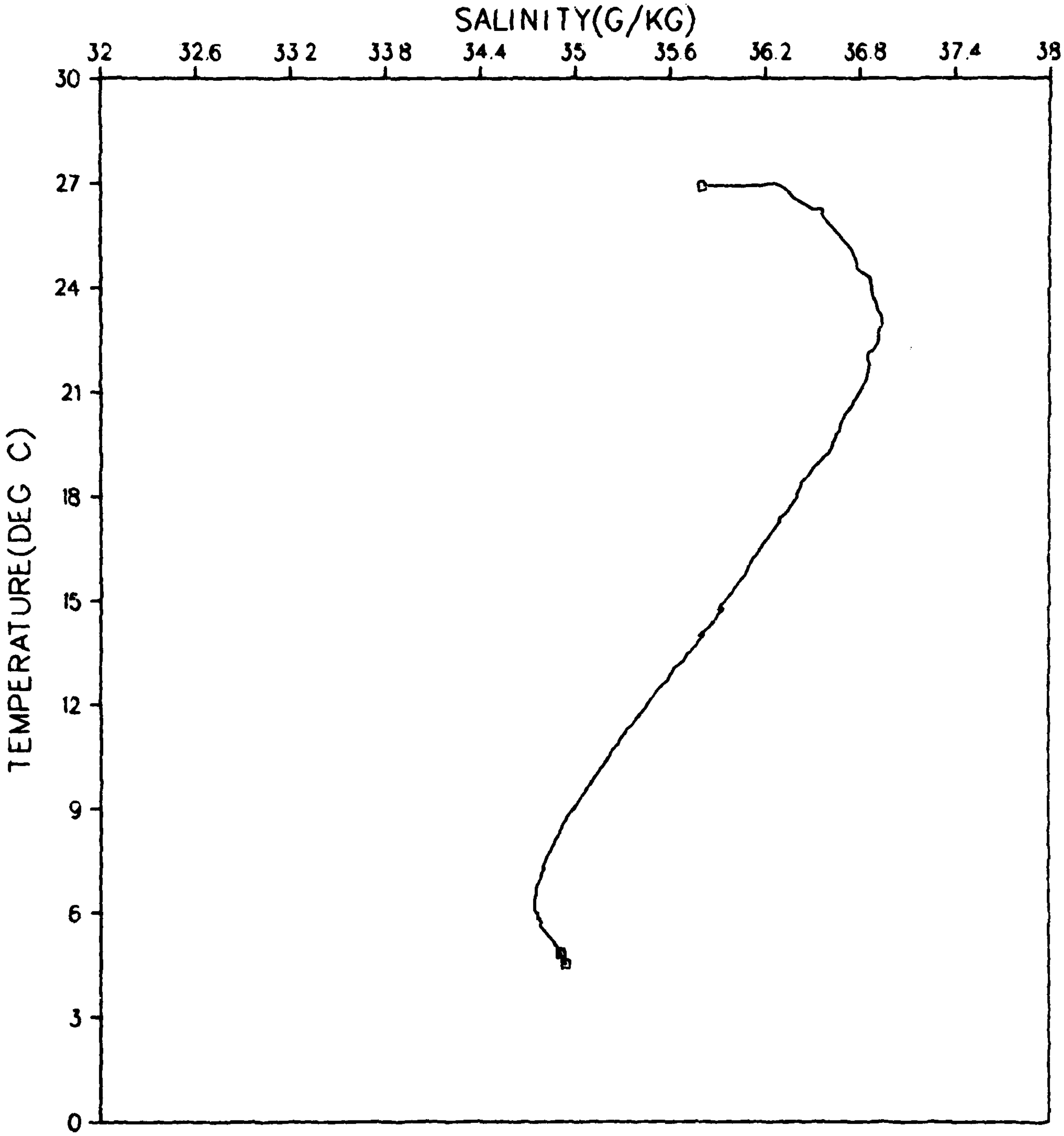


Figure 168.

GRENADA BASIN
STATION 081001
JANUARY 1980

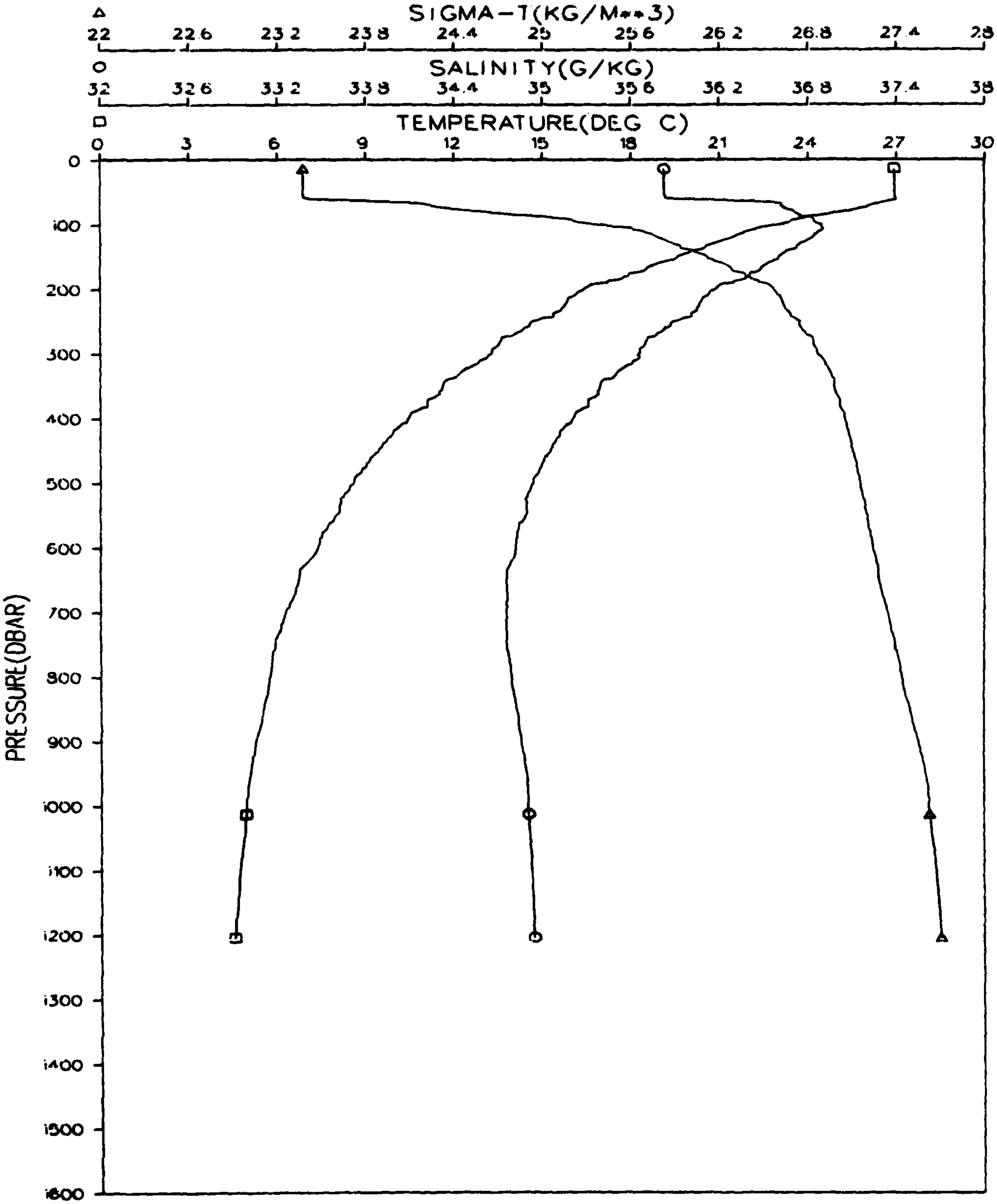


Figure 169.

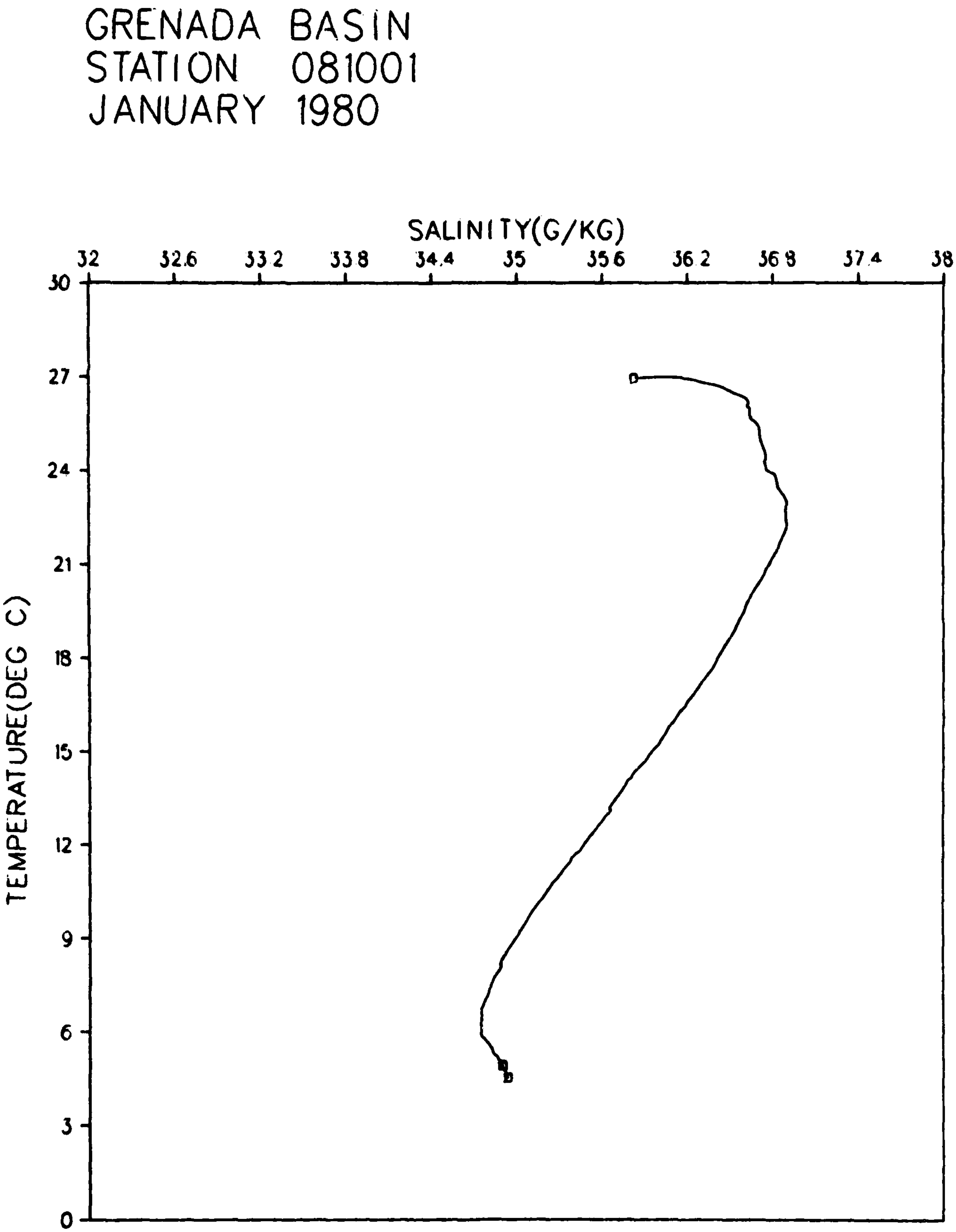

GRENADA BASIN
STATION 081001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 170.

GRENADA BASIN
STATION 082001
JANUARY 1980

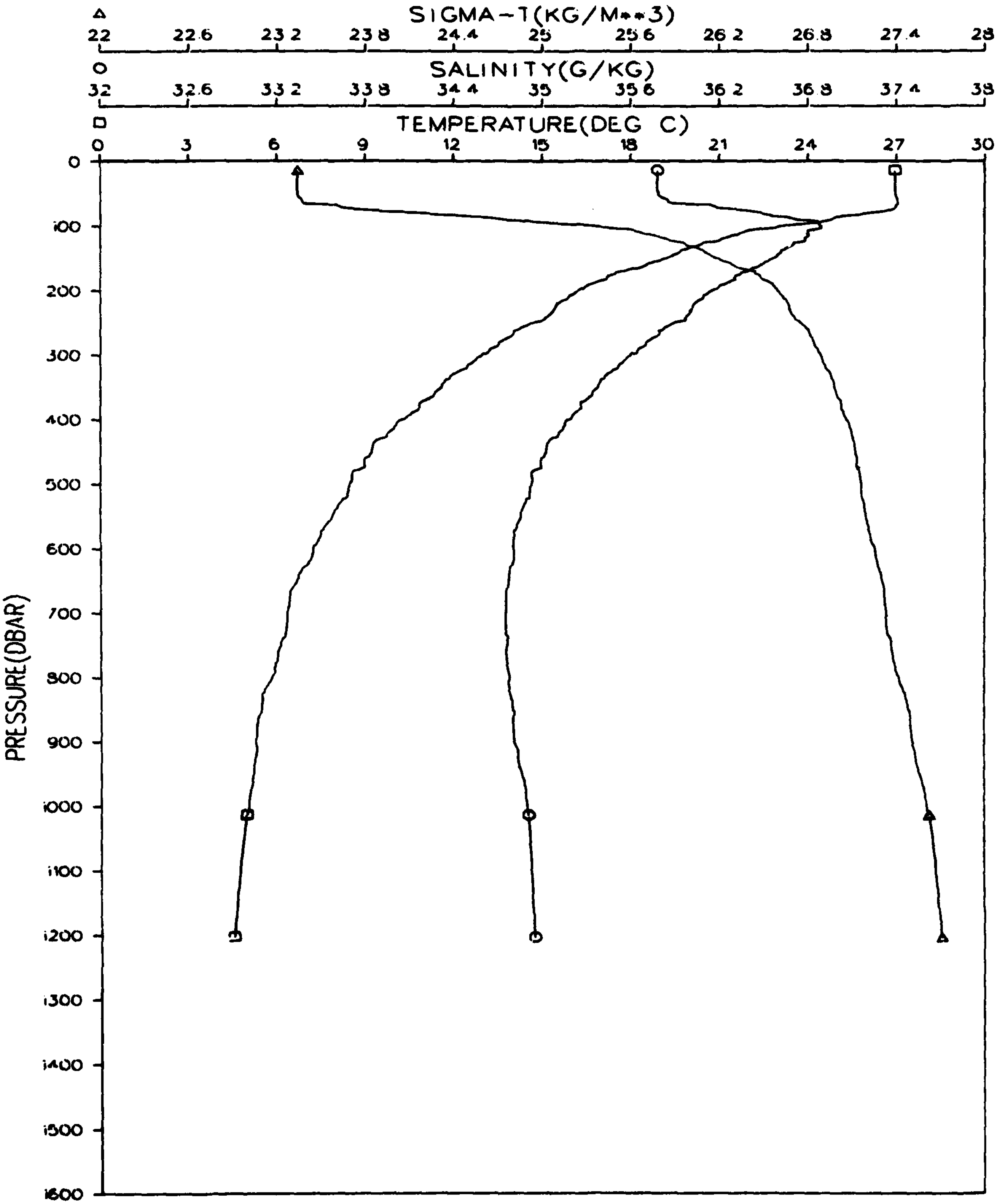


Figure 171.

GRENADA BASIN
STATION 082001
JANUARY 1980

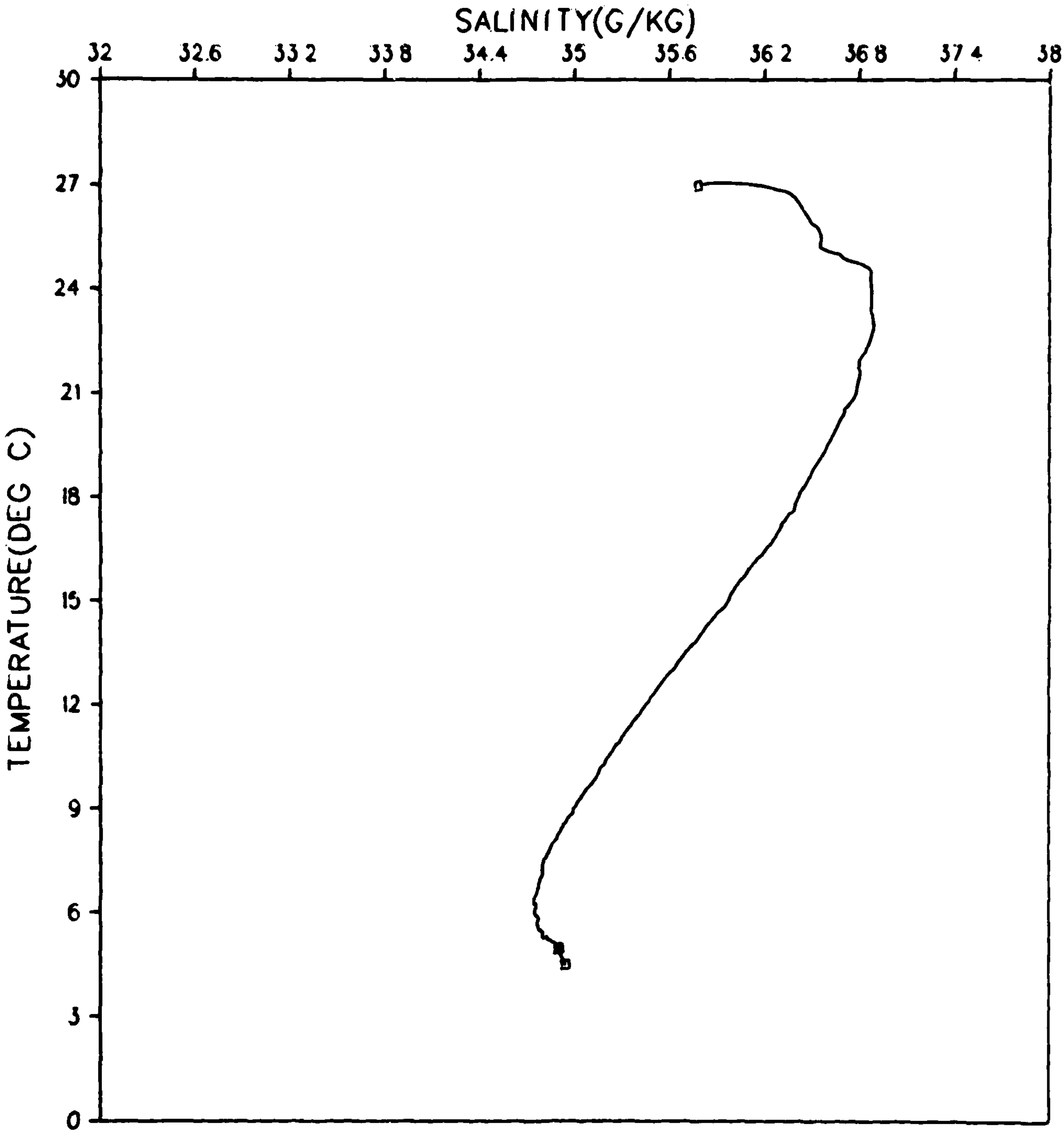


Figure 172.

GRENADA BASIN
STATION 083001
JANUARY 1980

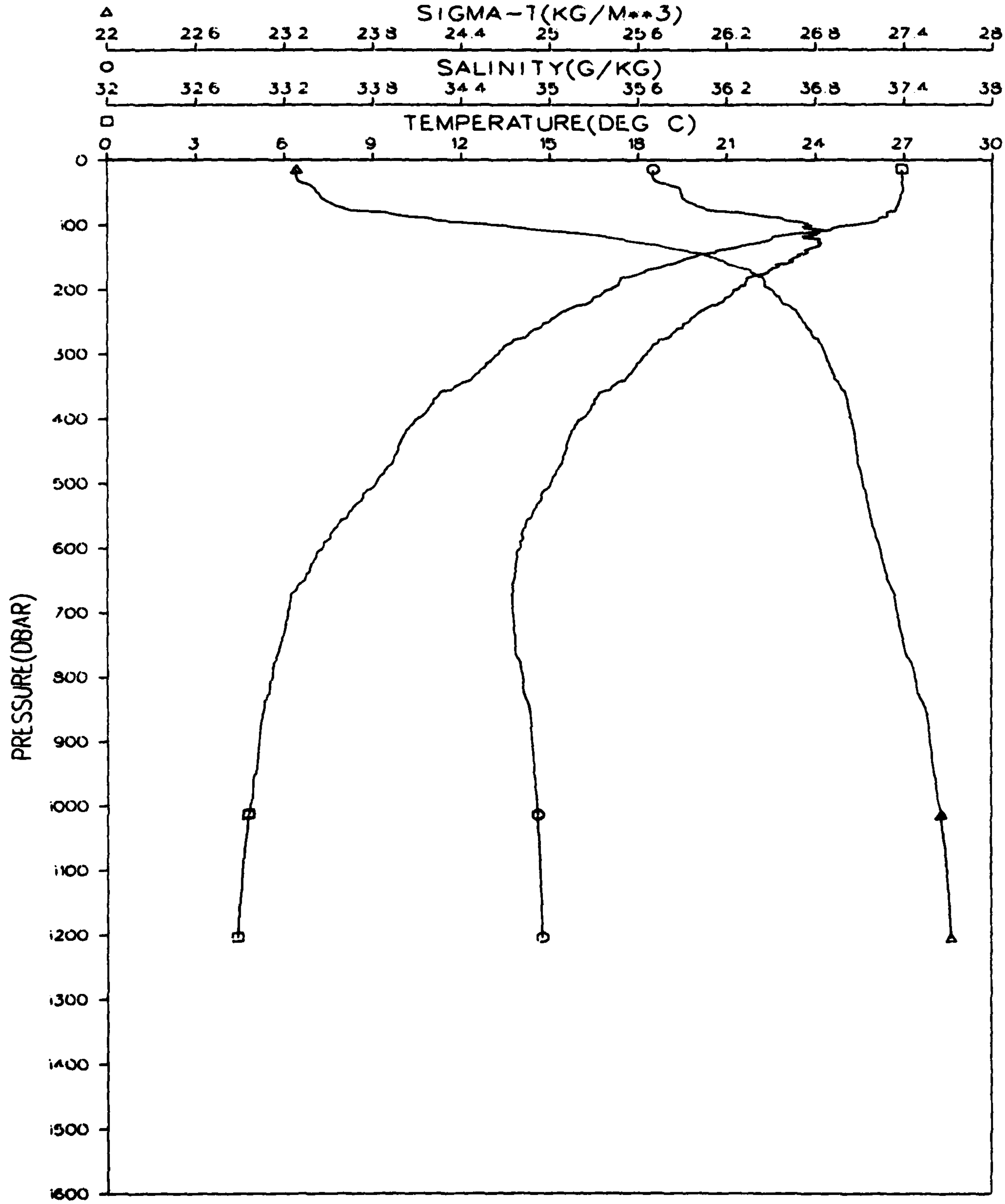


Figure 173.

GRENADA BASIN
STATION 083001
JANUARY 1980

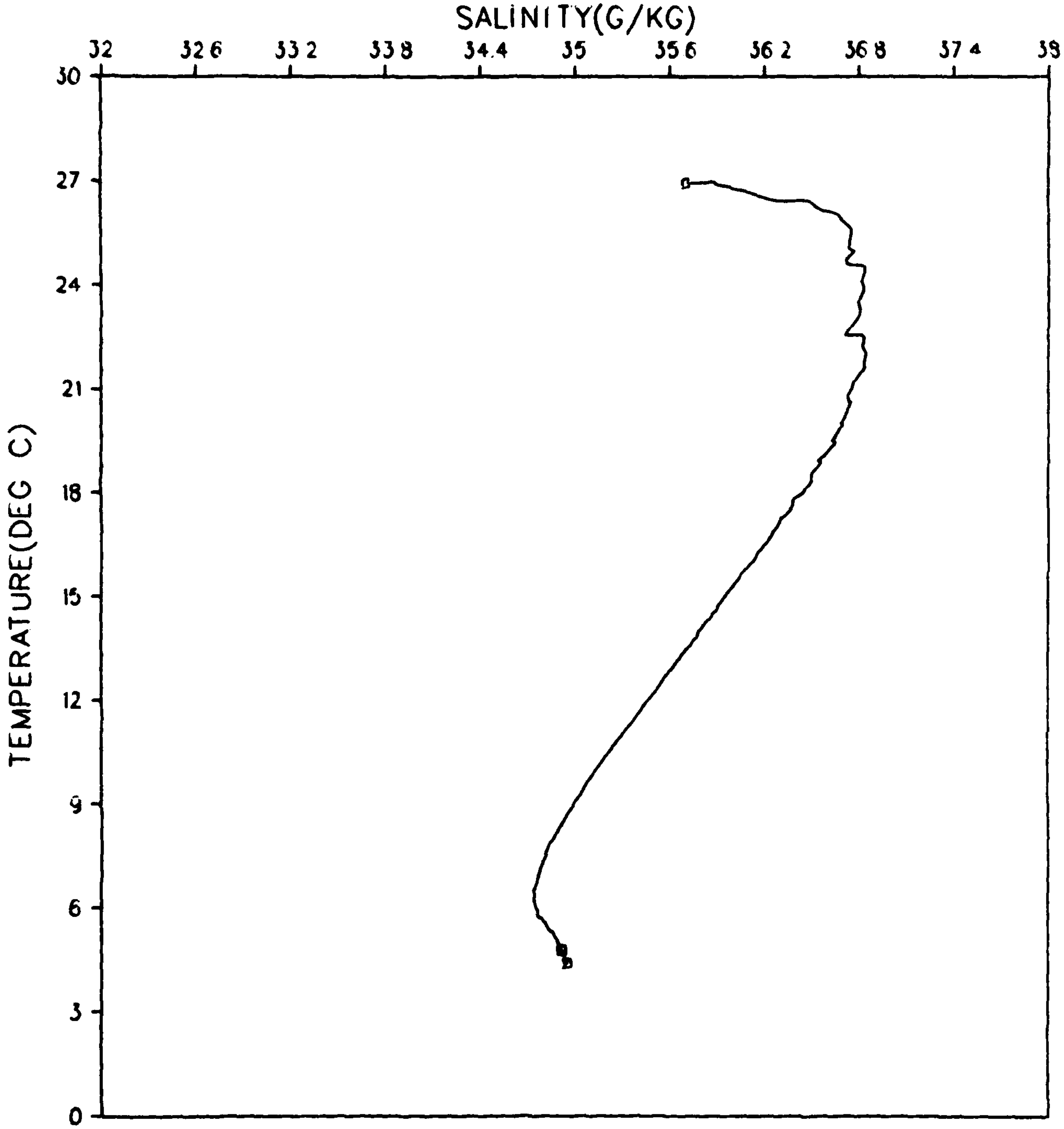


Figure 174.

GRENADA BASIN
STATION 084001
JANUARY 1980

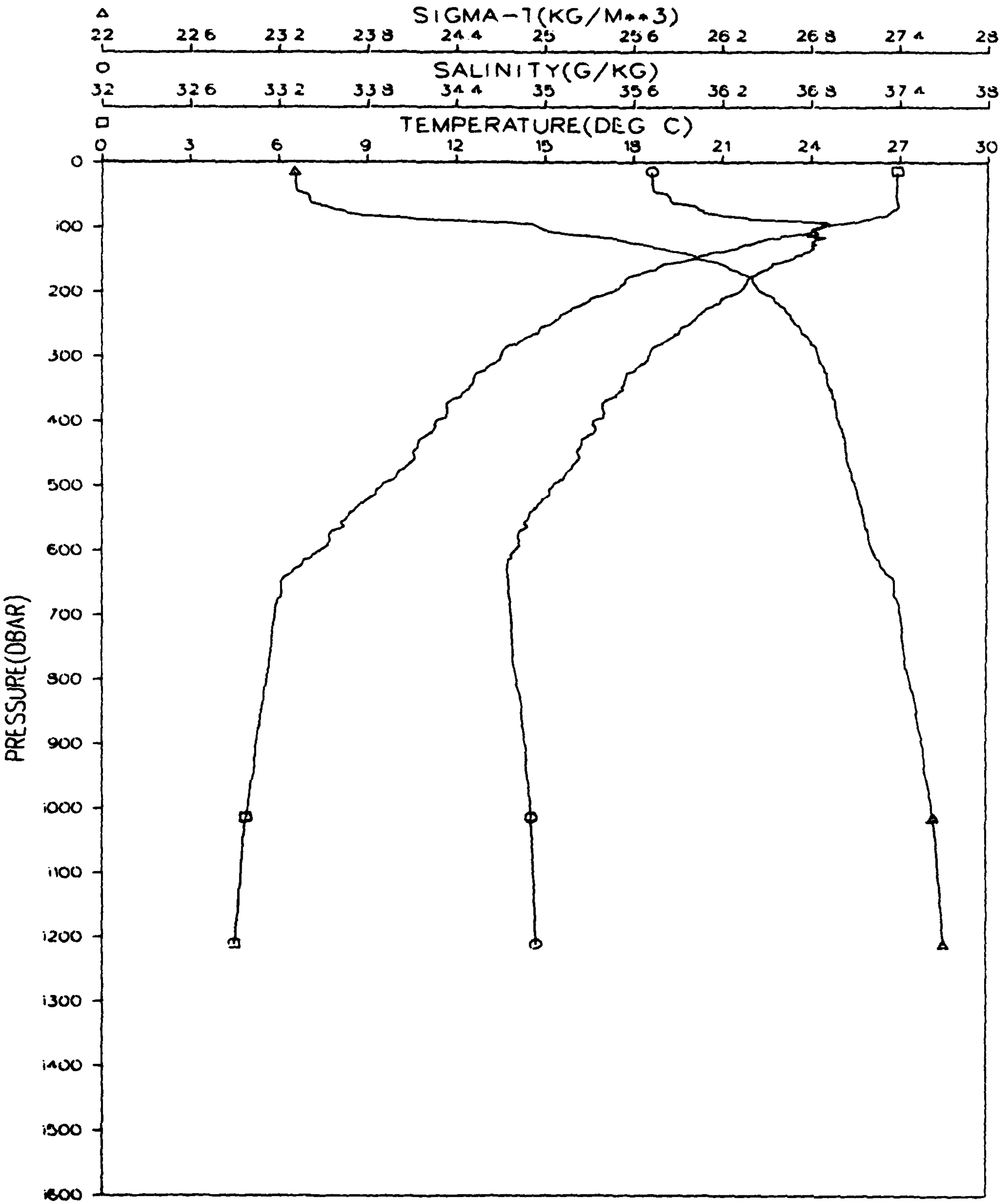


Figure 175.

GRENADA BASIN
STATION 084001
JANUARY 1980

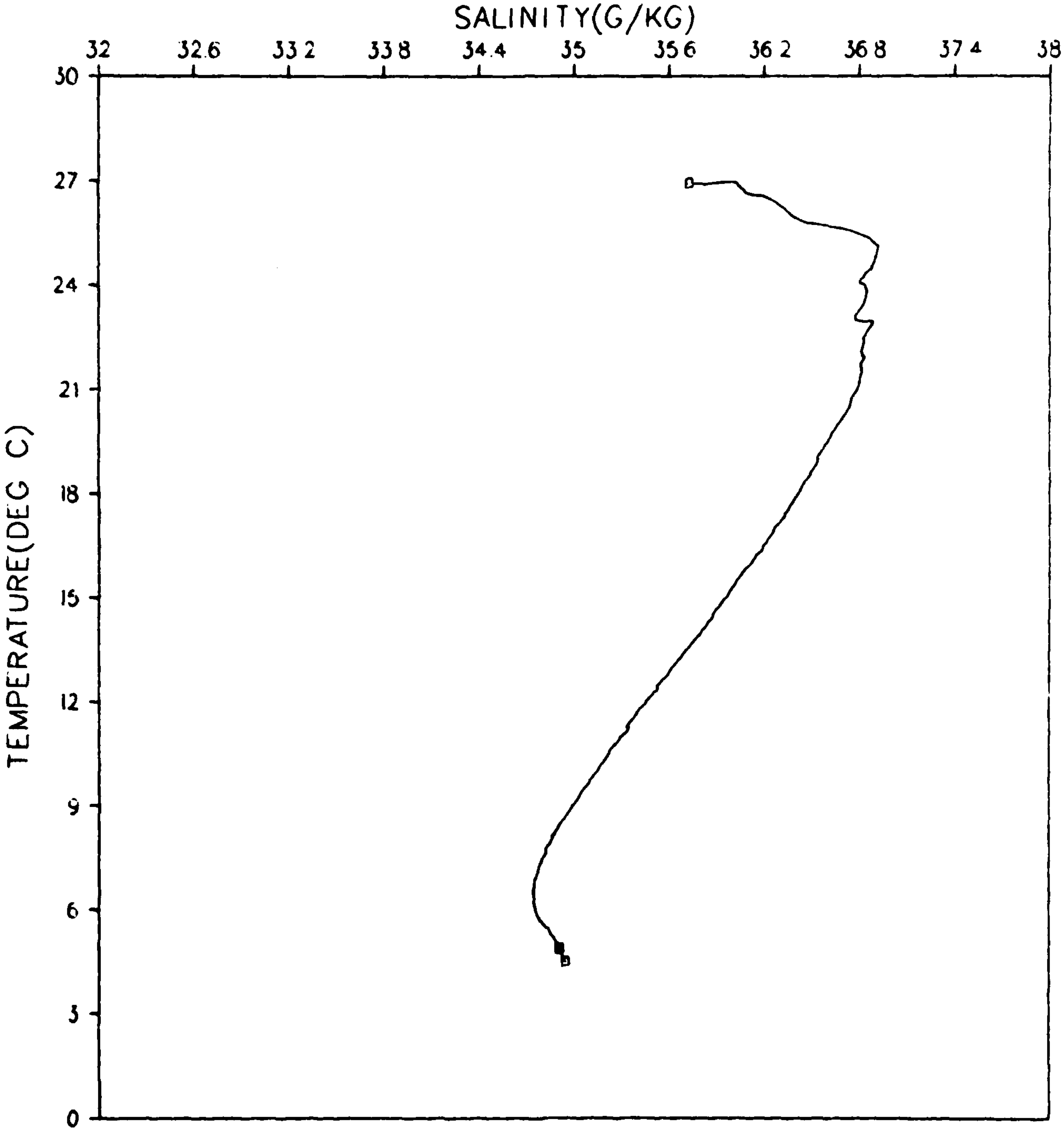


Figure 176.

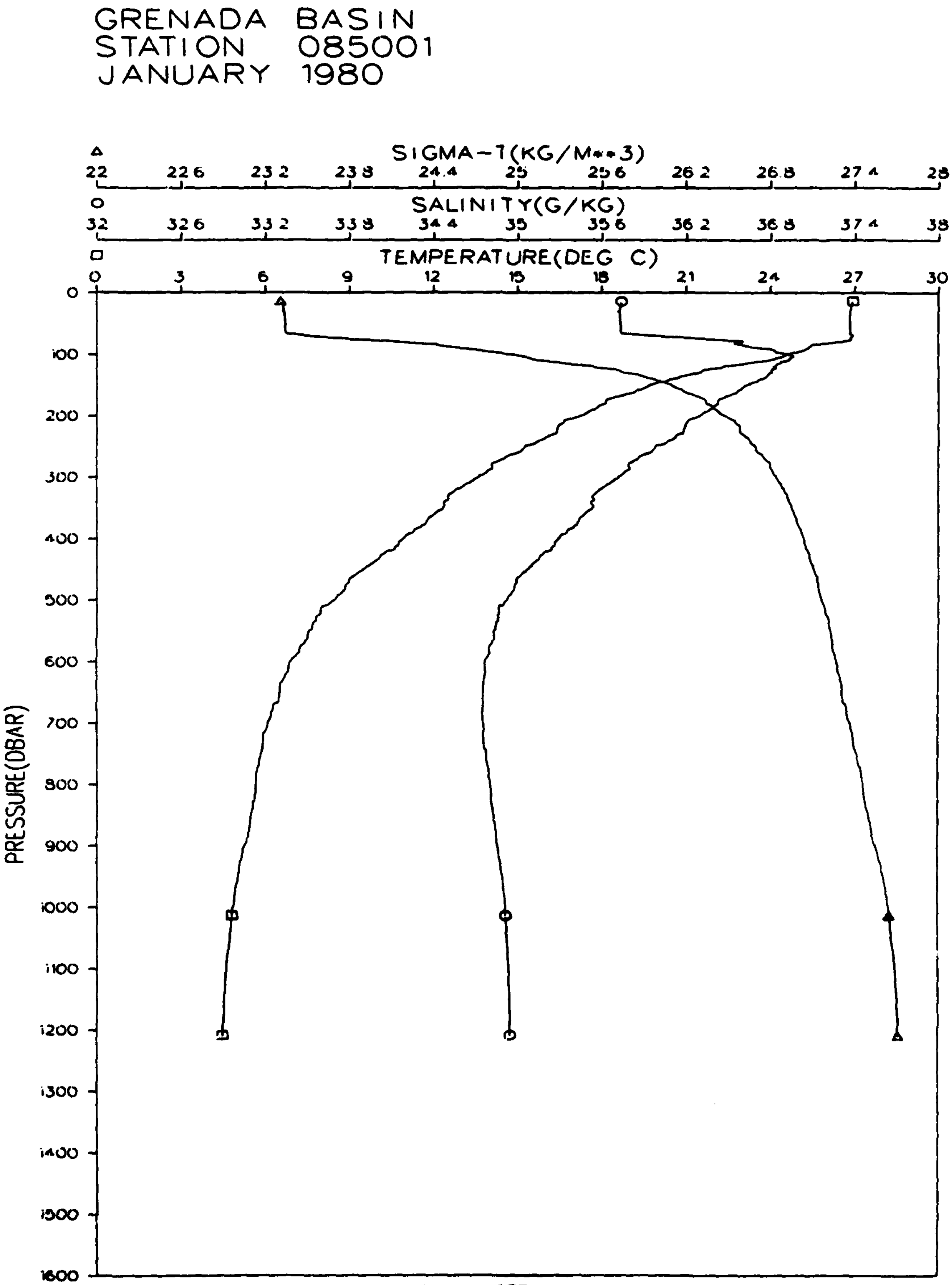

GRENADA BASIN
STATION 085001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 177.

GRENADA BASIN
STATION 085001
JANUARY 1980

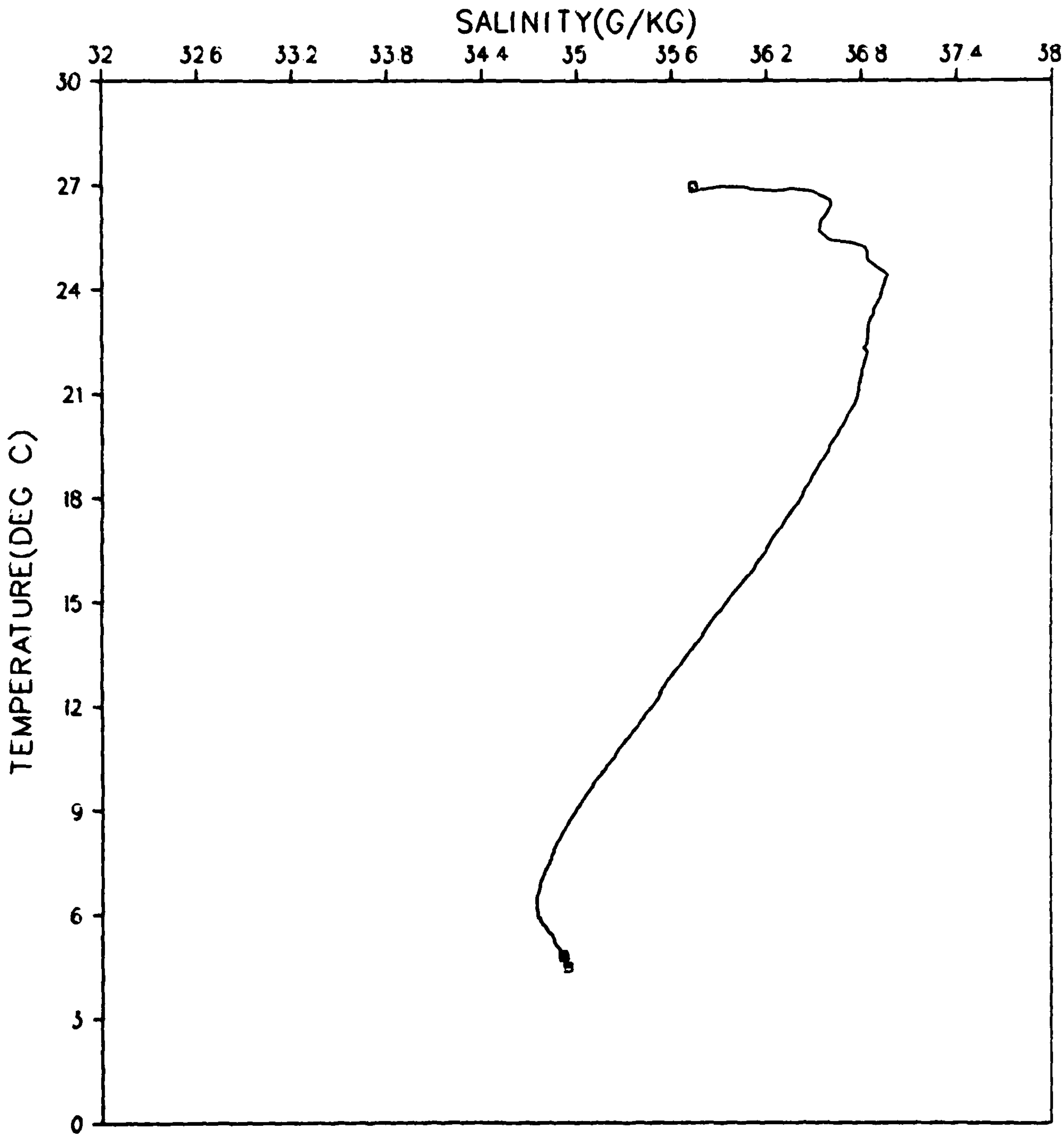


Figure 178.

GRENADA BASIN
STATION 086001
JANUARY 1980

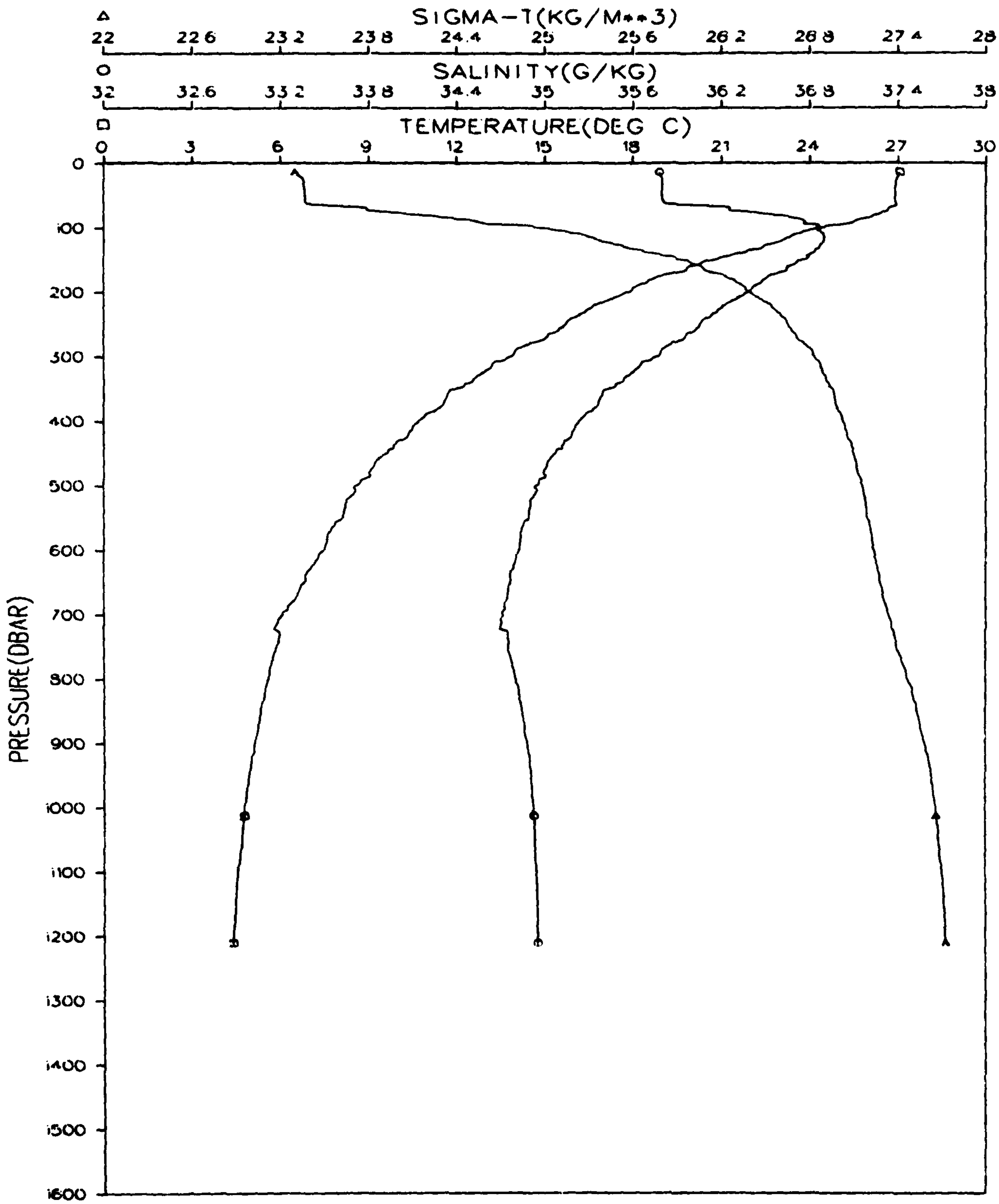


Figure 179.

GRENADA BASIN
STATION 086001
JANUARY 1980

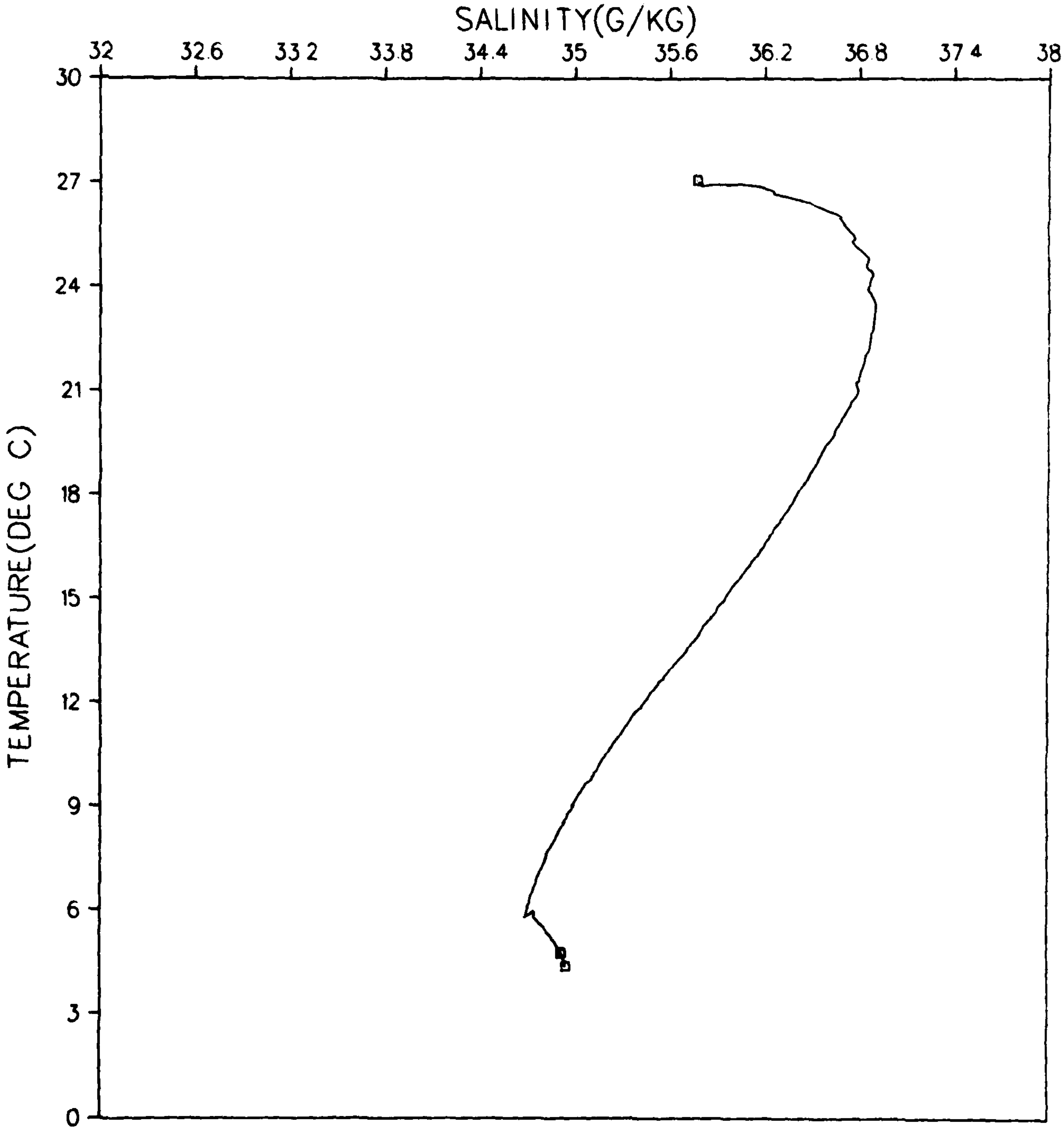
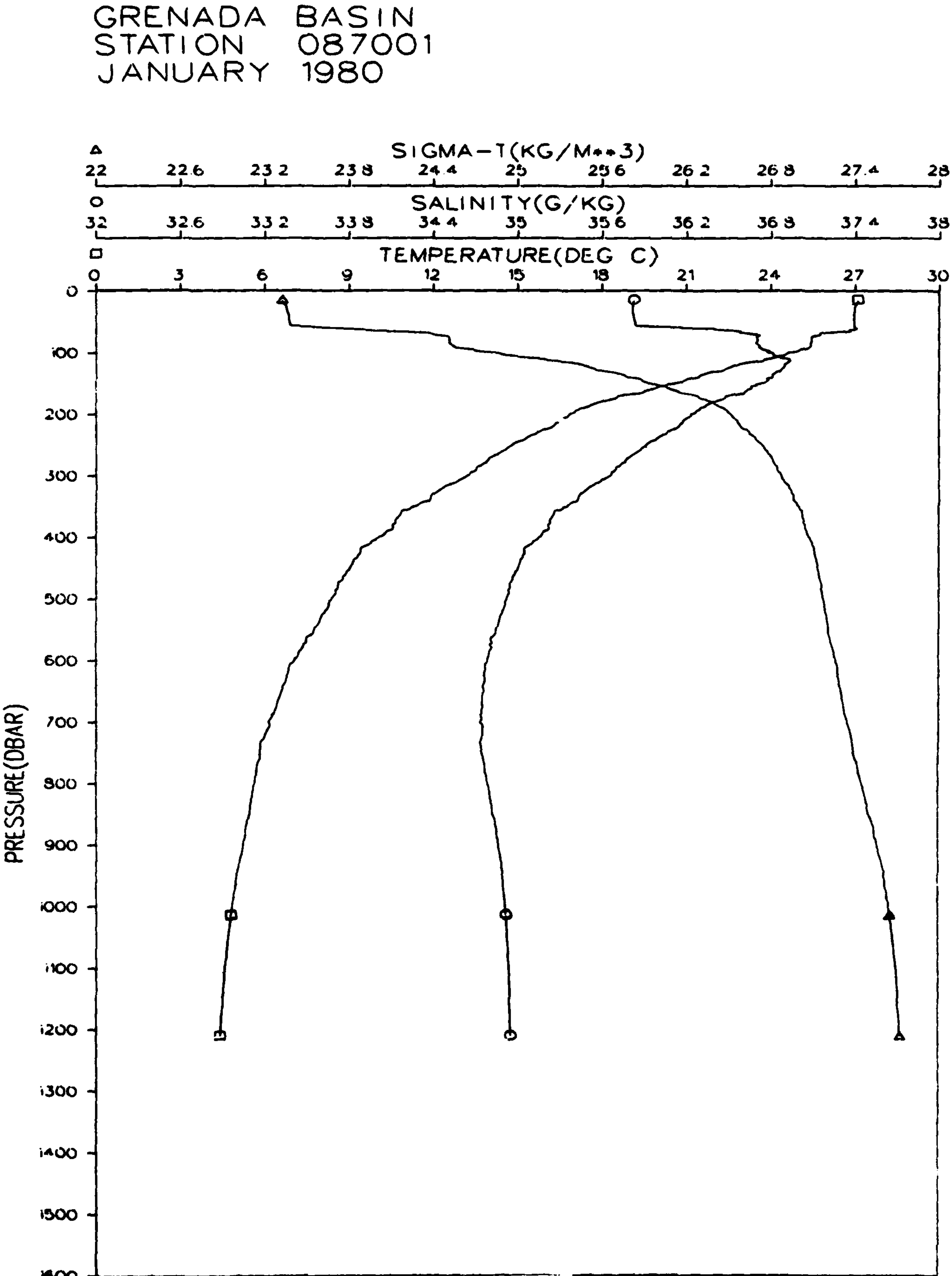
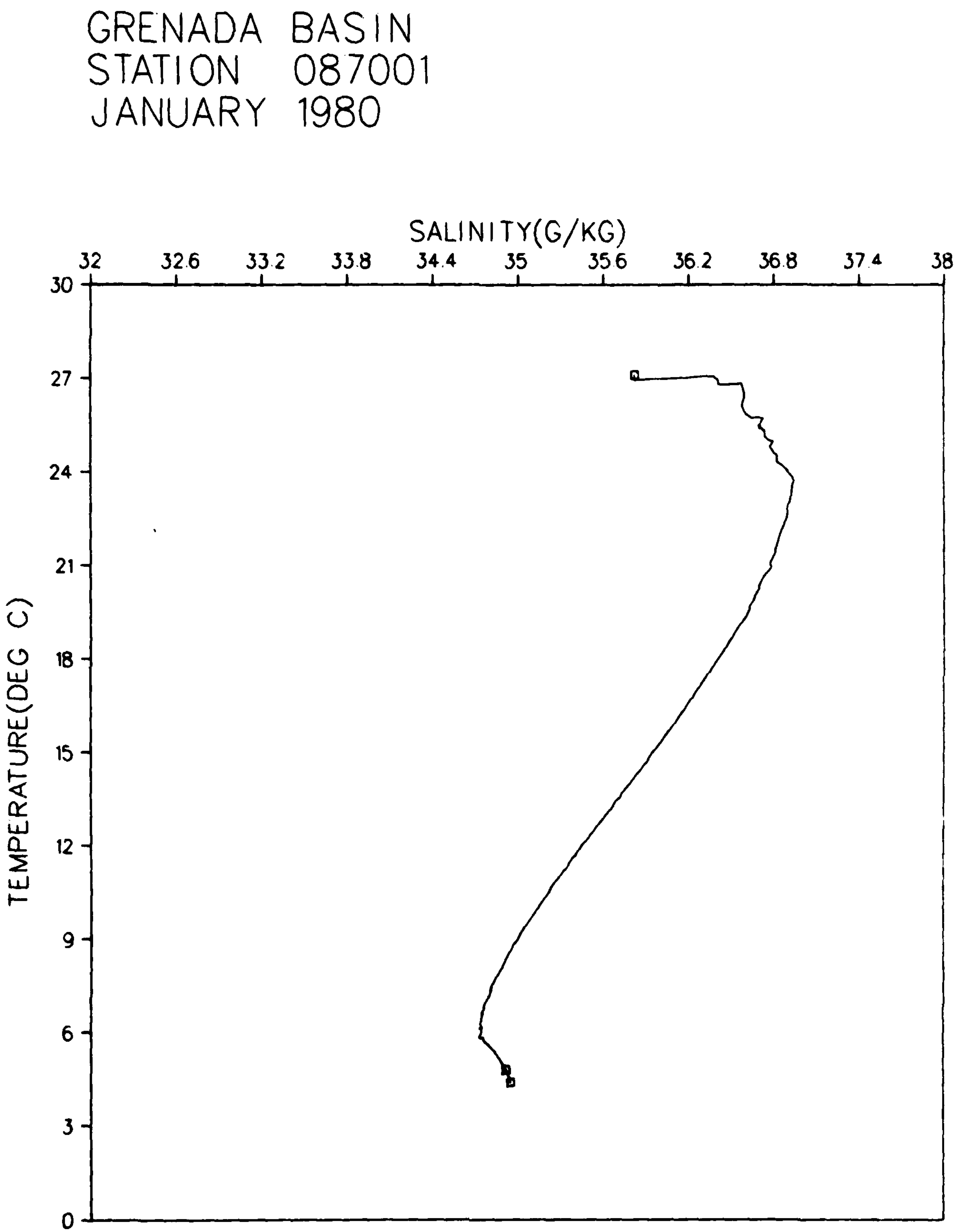


Figure 180.



GRENADA BASIN
STATION 087001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 181.



GRENADA BASIN
STATION 087001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 182.

GRENADA BASIN
STATION 088001
JANUARY 1980

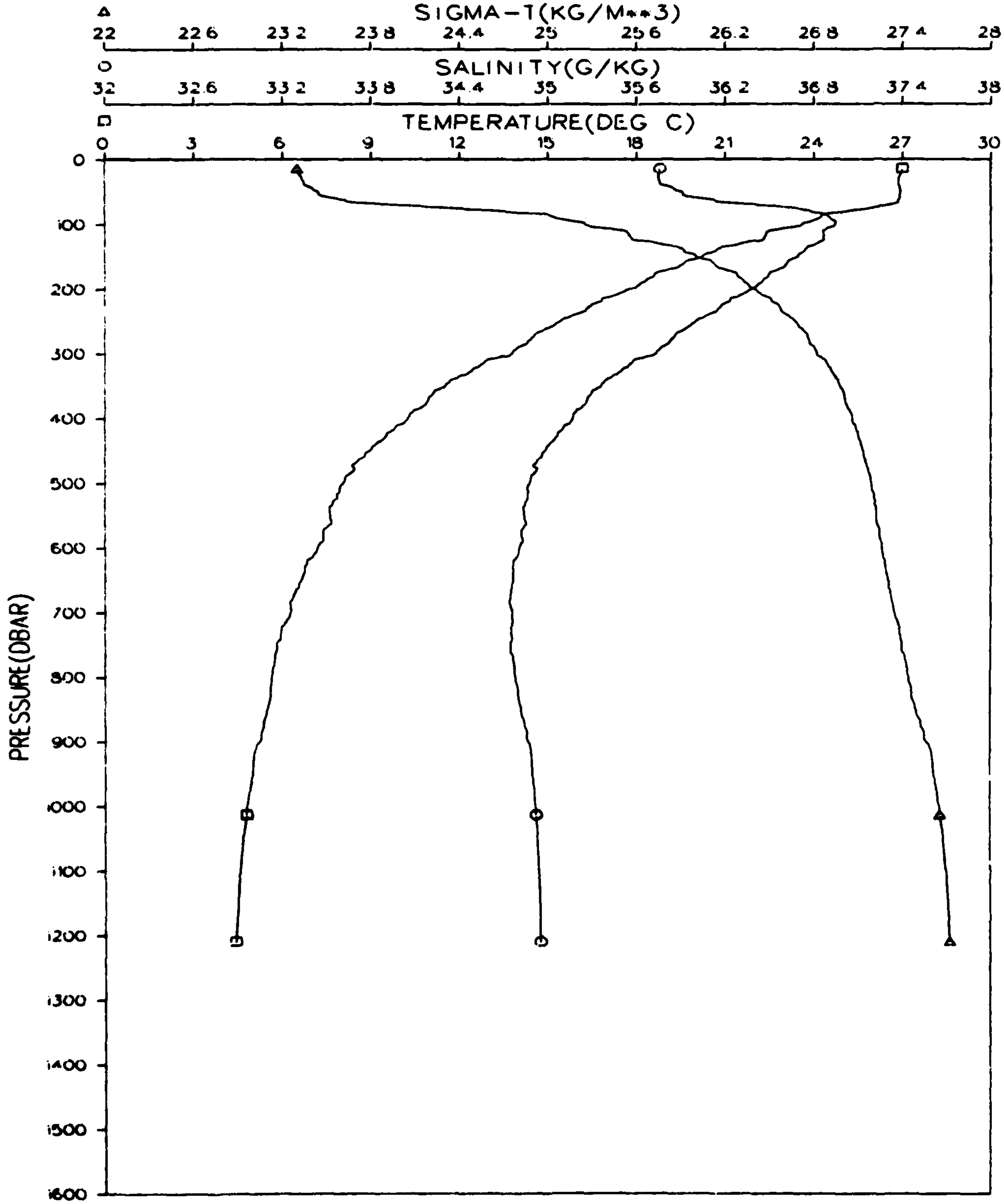


Figure 183.

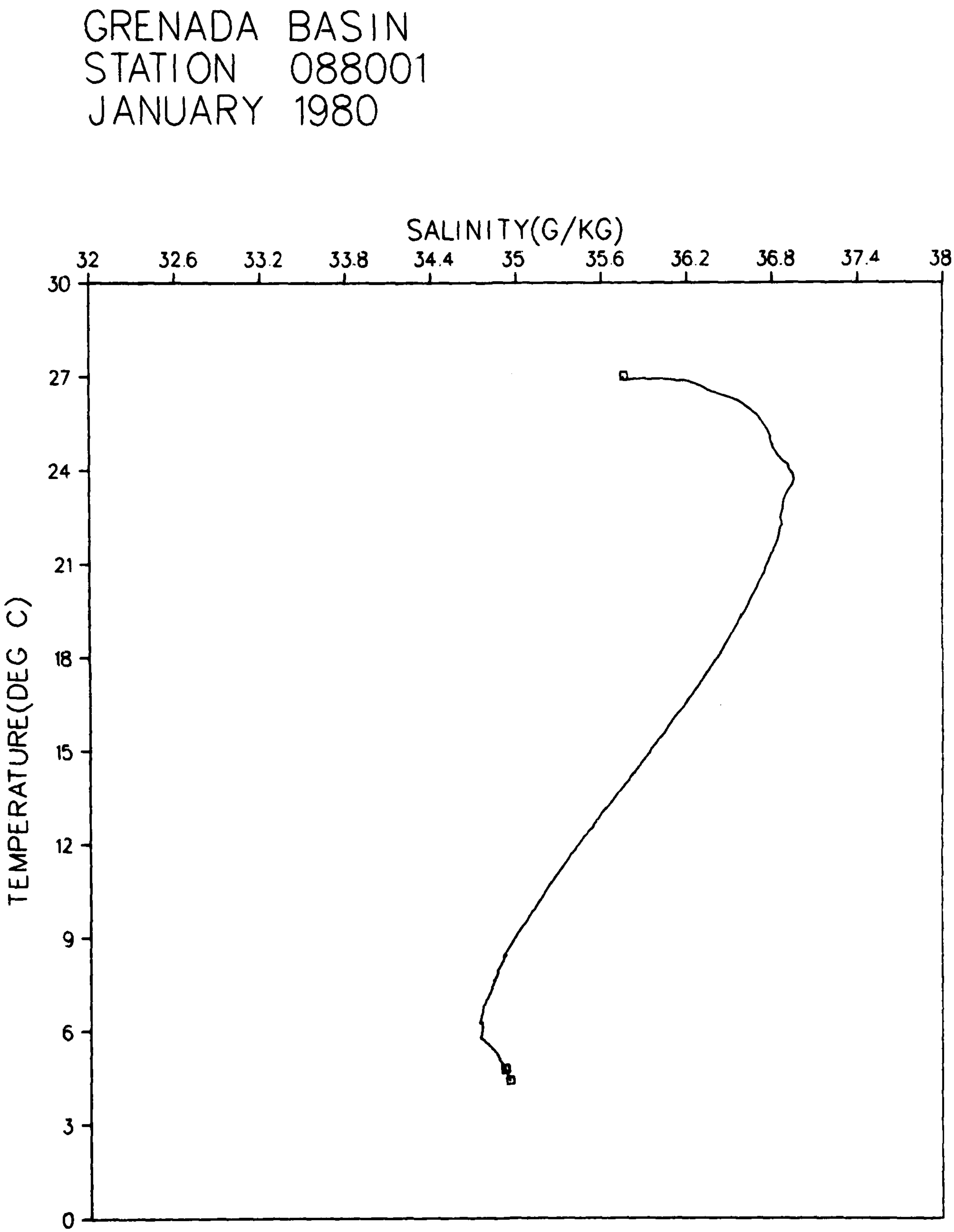

GRENADA BASIN
STATION 088001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 184.

GRENADA BASIN
STATION 089001
JANUARY 1980

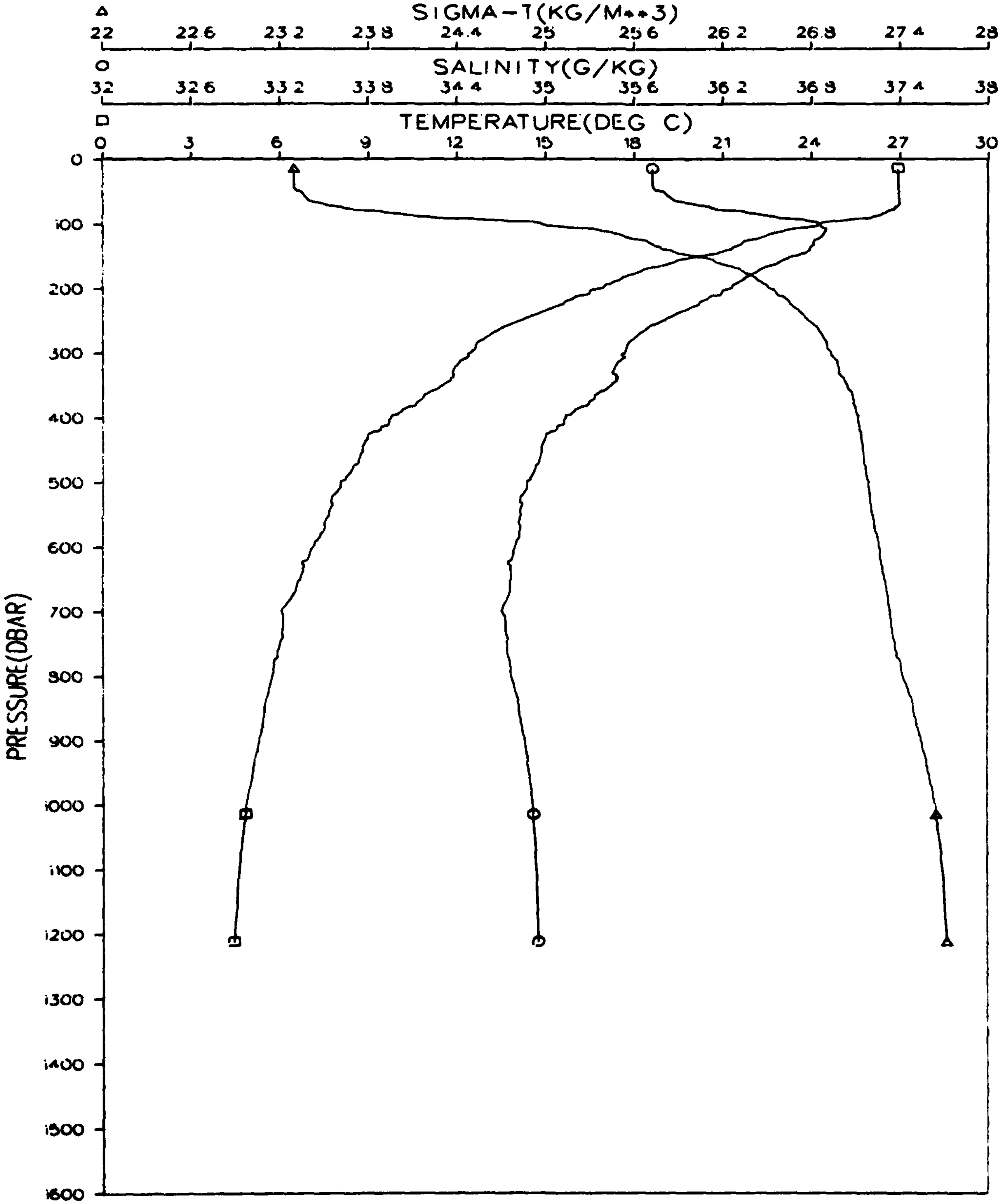


Figure 185.

GRENADA BASIN
STATION 089001
JANUARY 1980

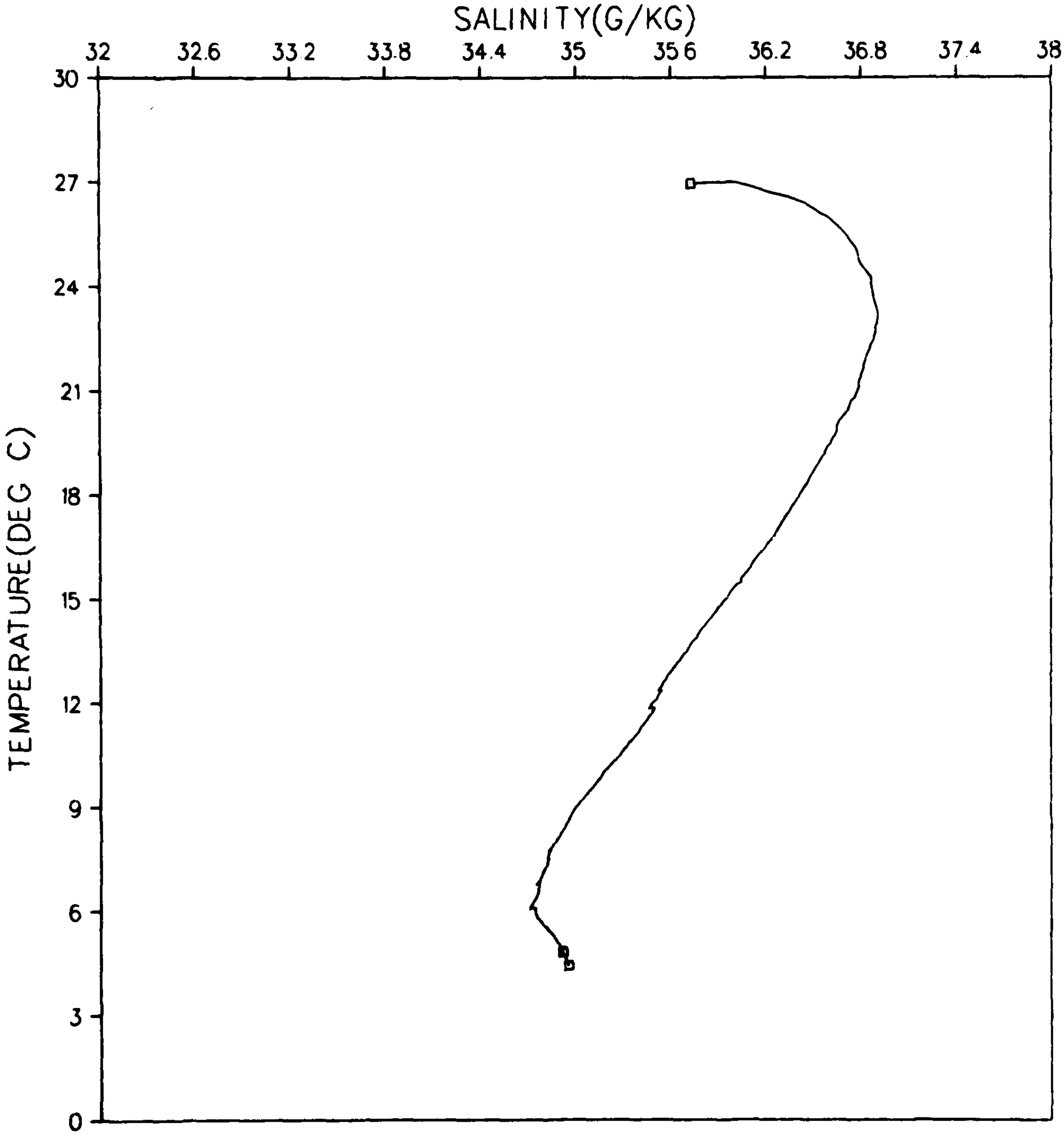


Figure 186.

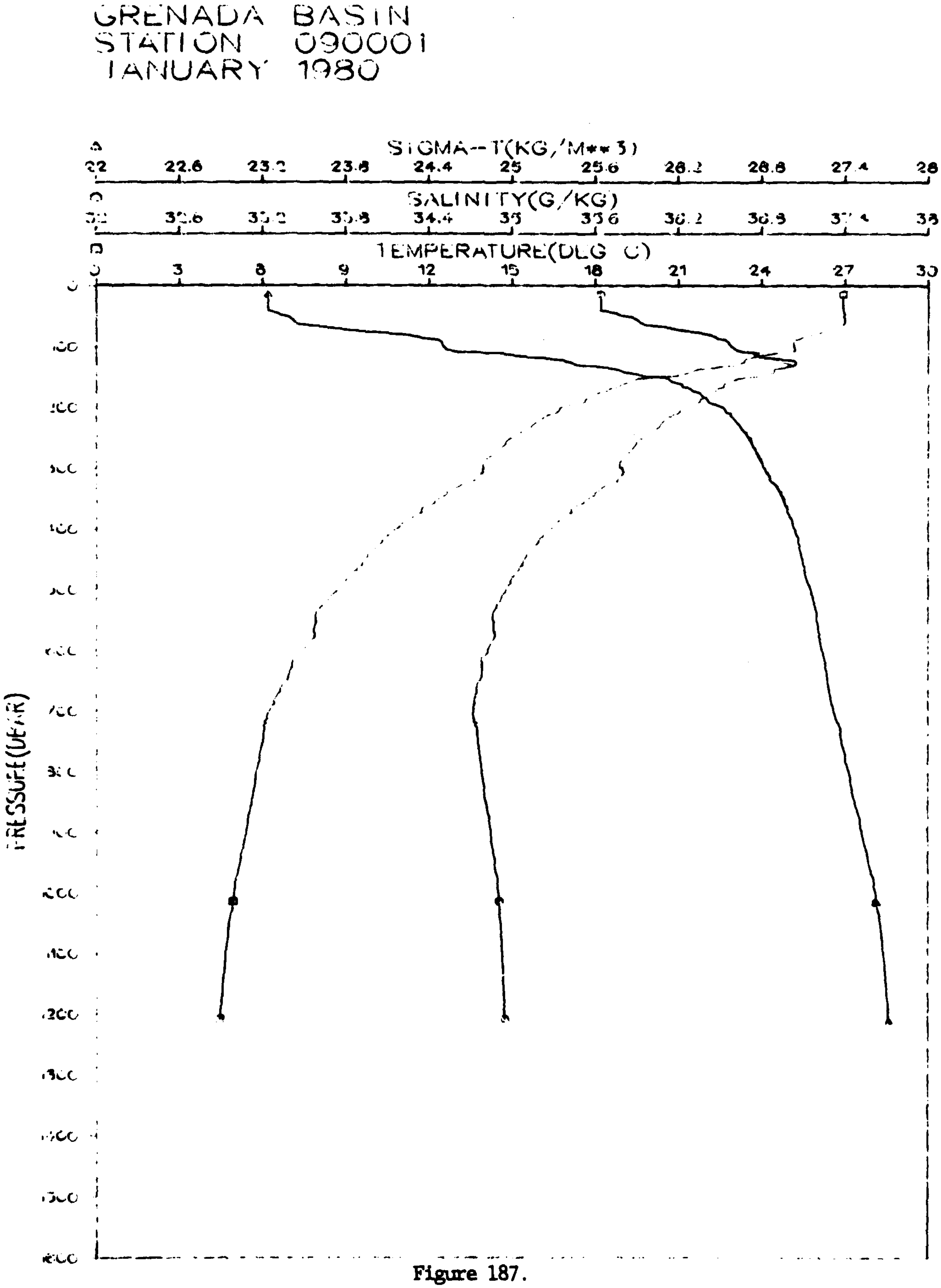

GRENADA BASIN
STATION 090001
JANUARY 1980
SIGMA--T(KG/M**3)
SALINITY(G/KG)
TEMPERATURE(DEG C)
PRESSURE(DBAR)

Figure 187.

GRENADA BASIN
STATION 090001
JANUARY 1980

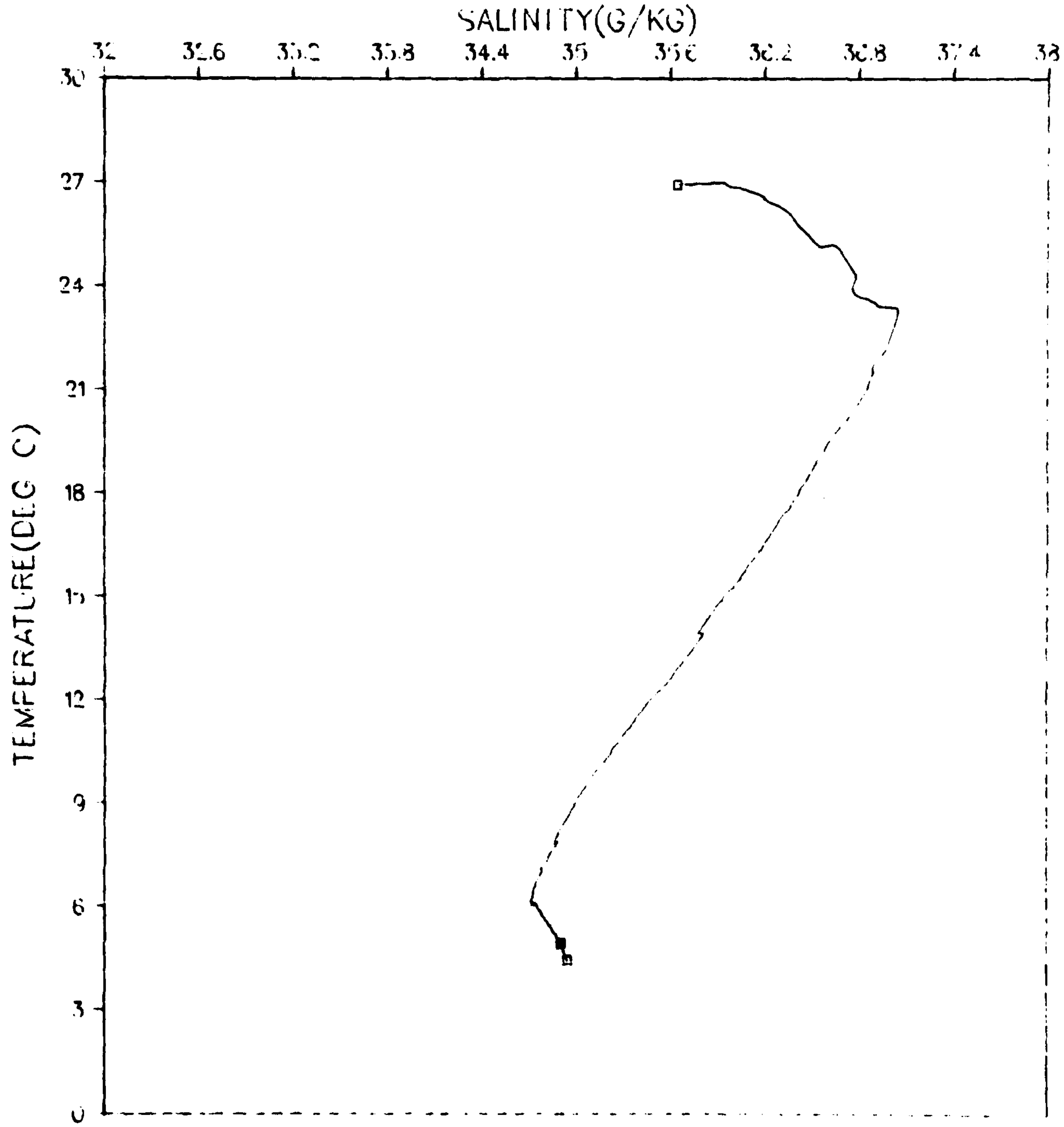


Figure 188.

GRENADA BASIN
STATION 091001
JANUARY 1980

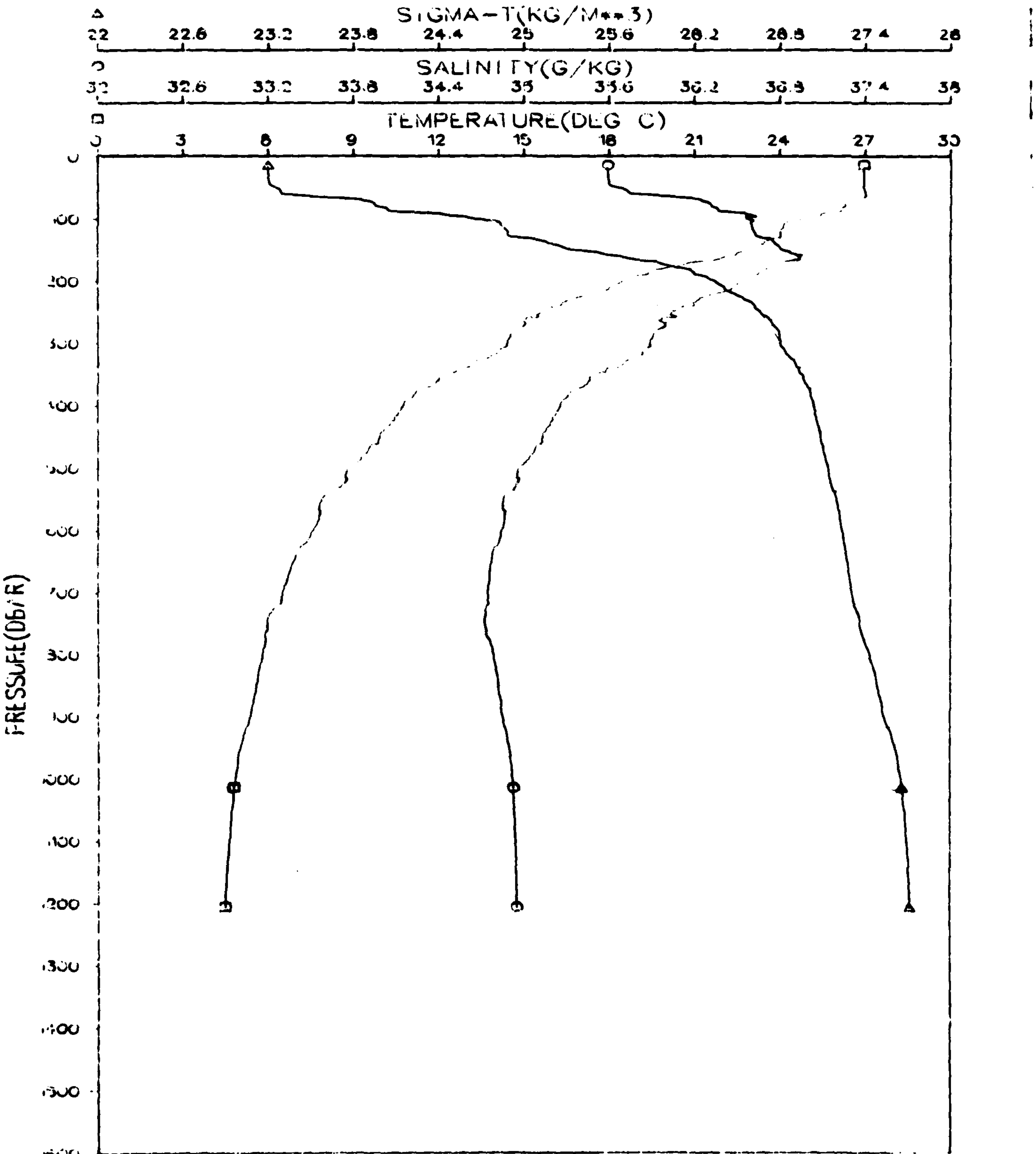


Figure 189.

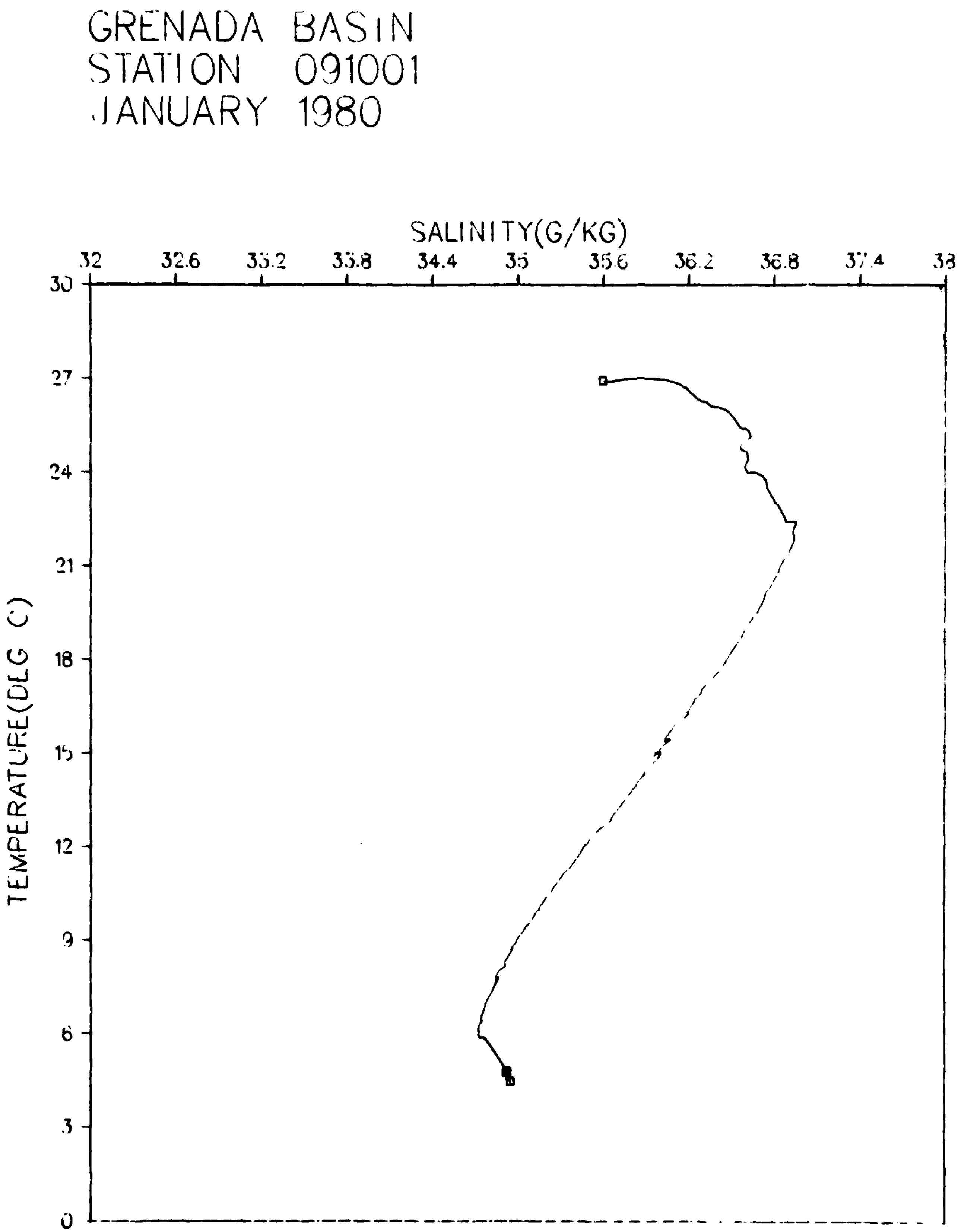

GRENADA BASIN
STATION 091001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 190.

GRENADA BASIN
STATION 092001
JANUARY 1980

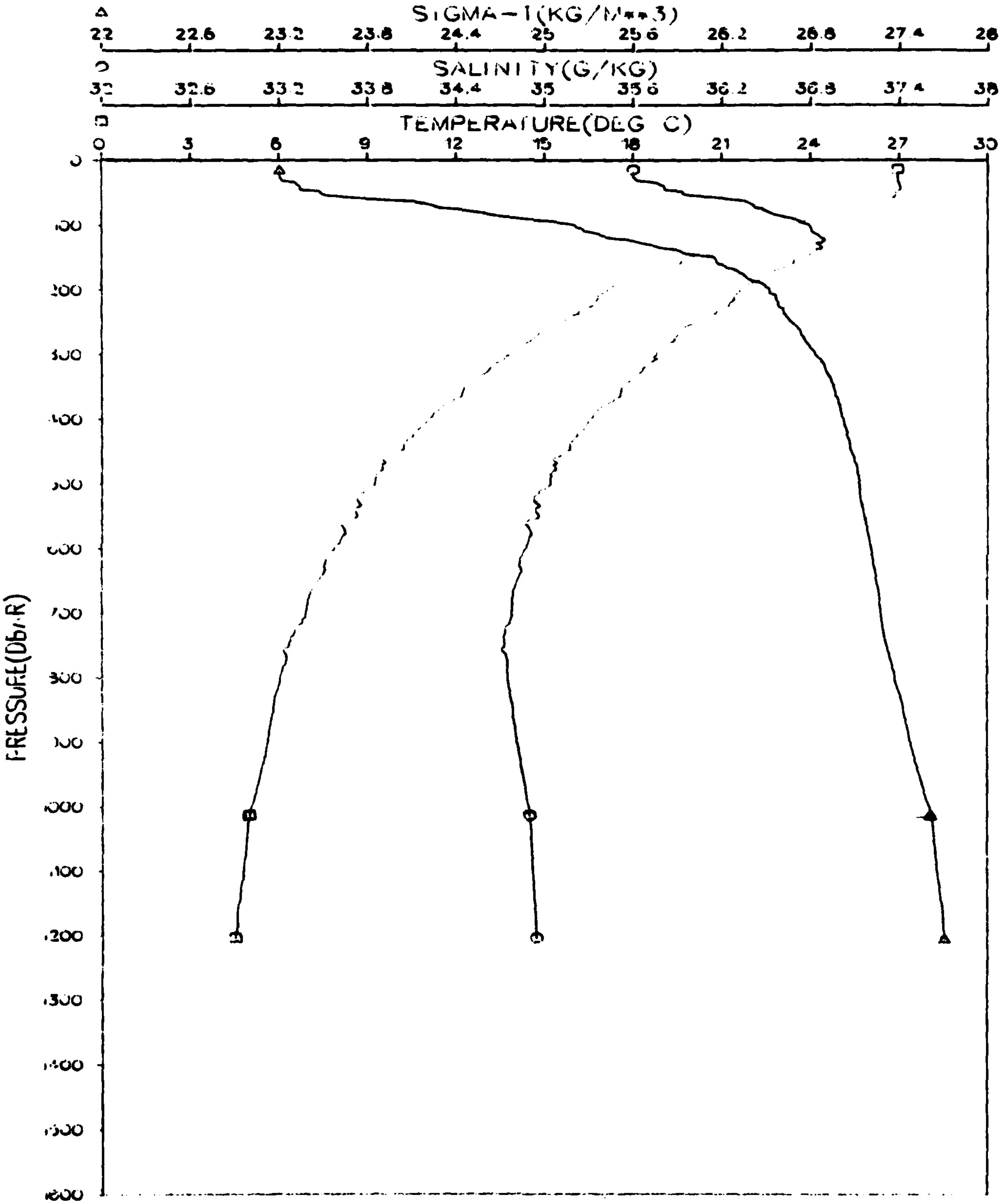


Figure 191.

GRENADA BASIN
STATION 092001
JANUARY 1980

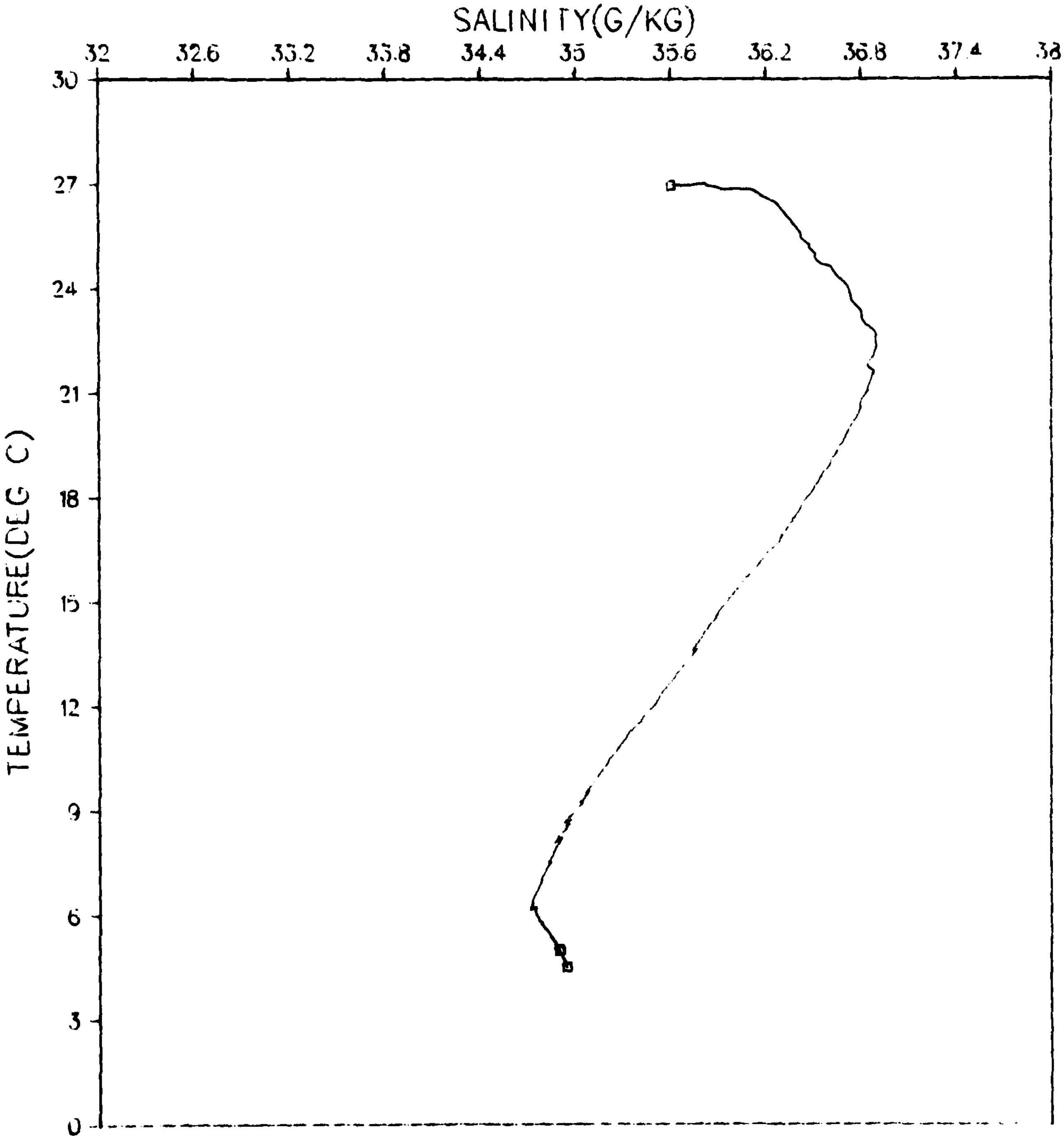


Figure 192.

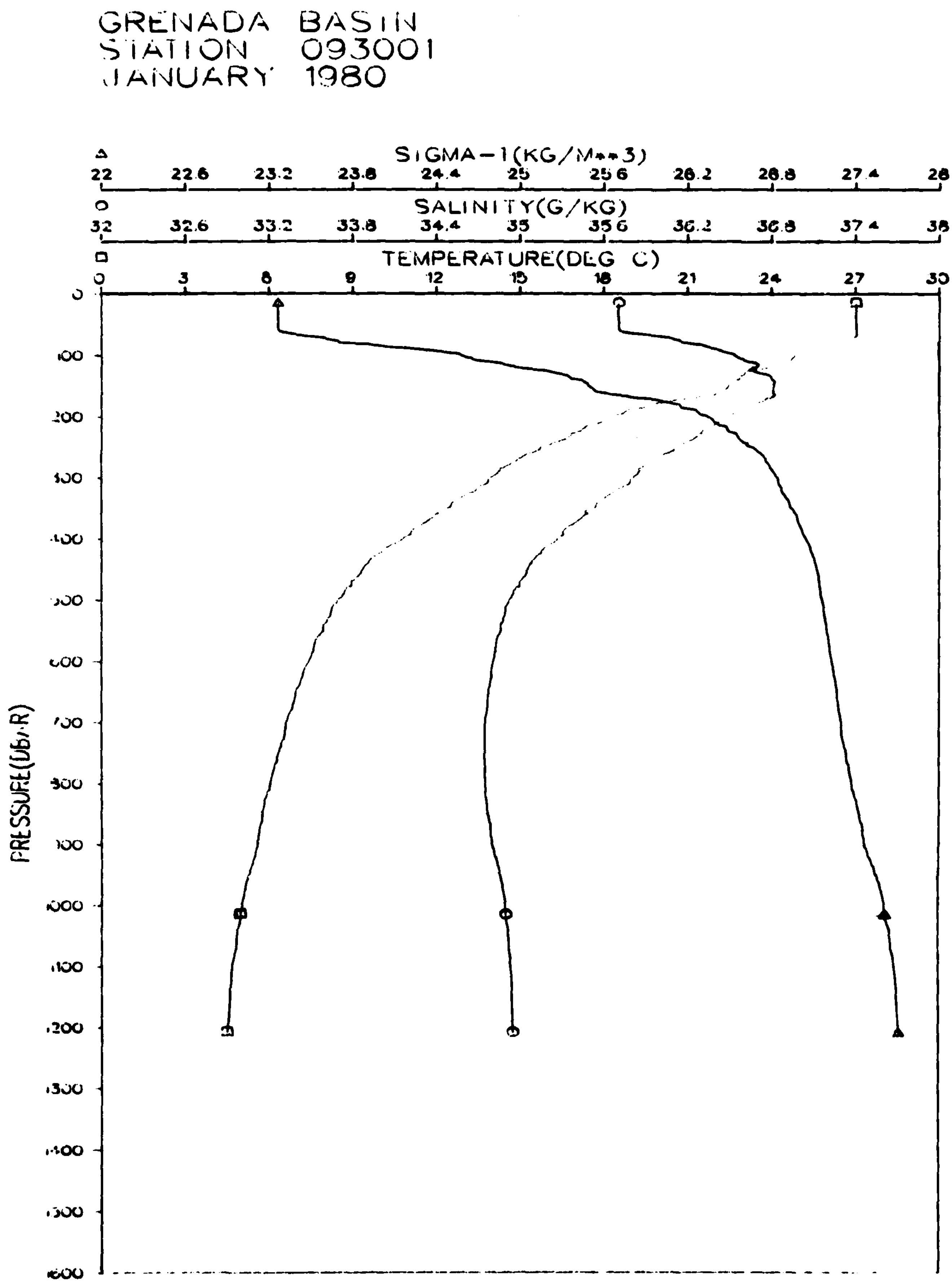

GRENADA BASIN
STATION 093001
JANUARY 1980
SIGMA-1(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 193.

GRENADA BASIN
STATION 093001
JANUARY 1980

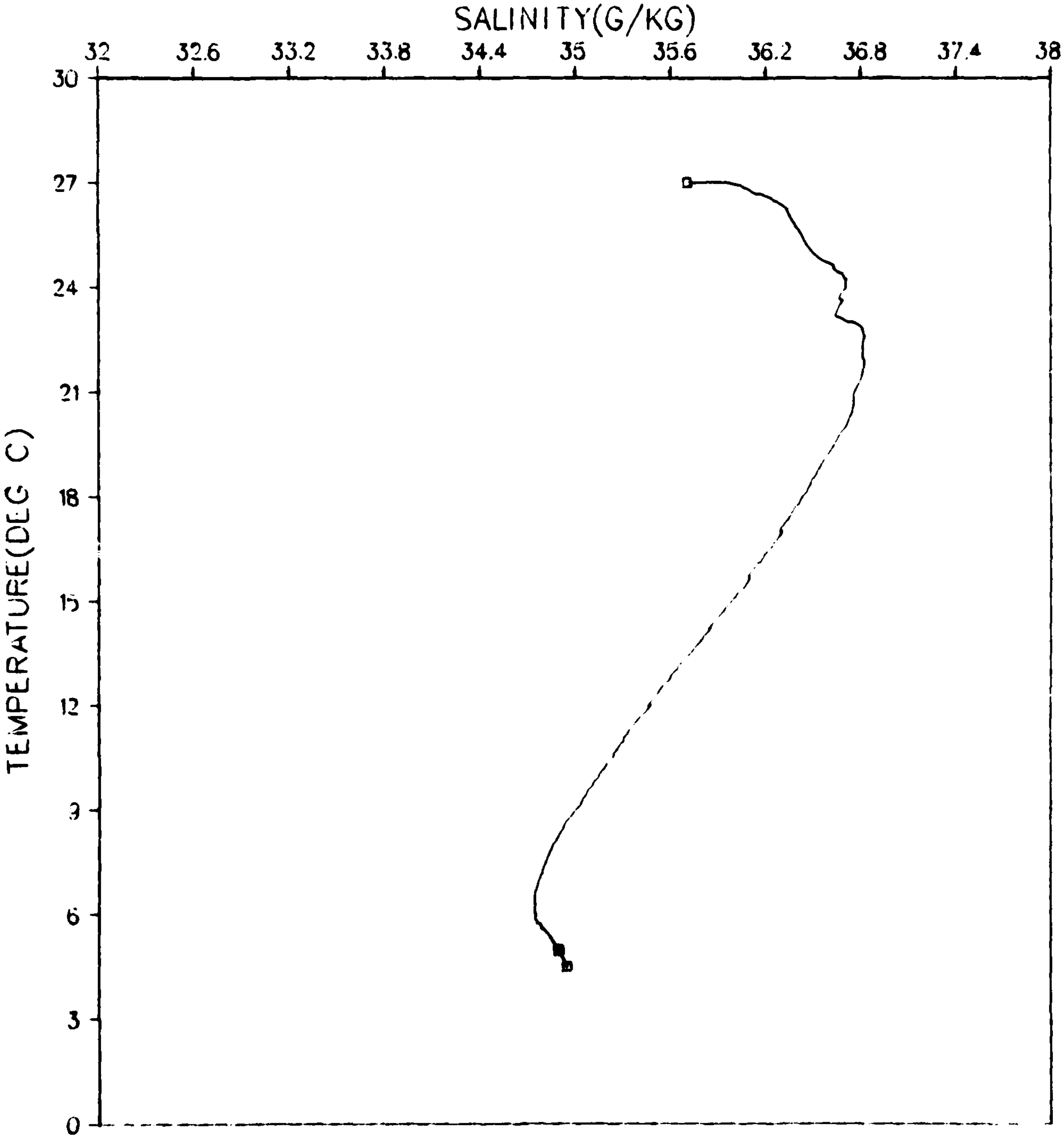


Figure 194.

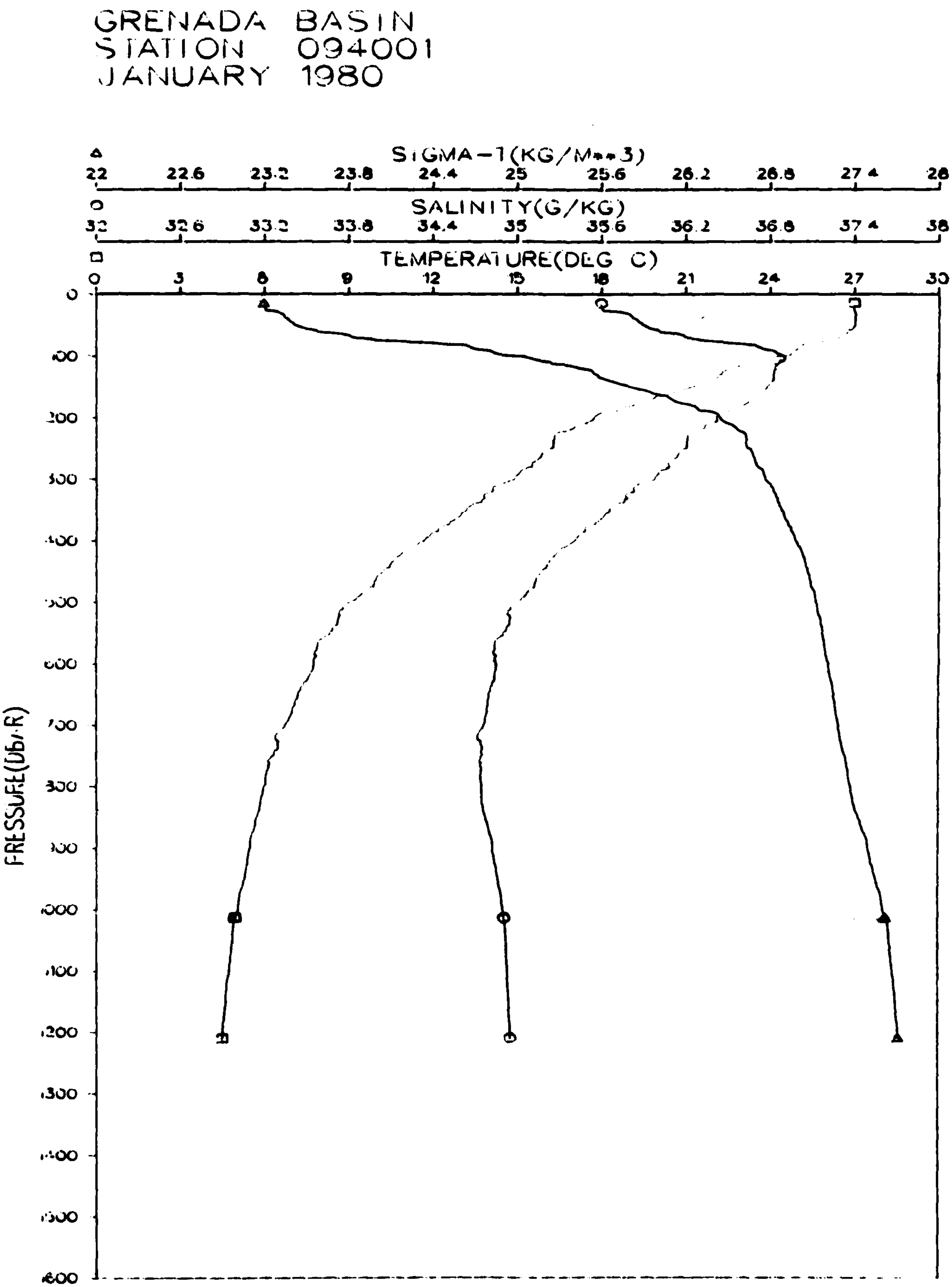

GRENADA BASIN
STATION 094001
JANUARY 1980
SIGMA-1(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 195.

GRENADA BASIN
STATION 094001
JANUARY 1980

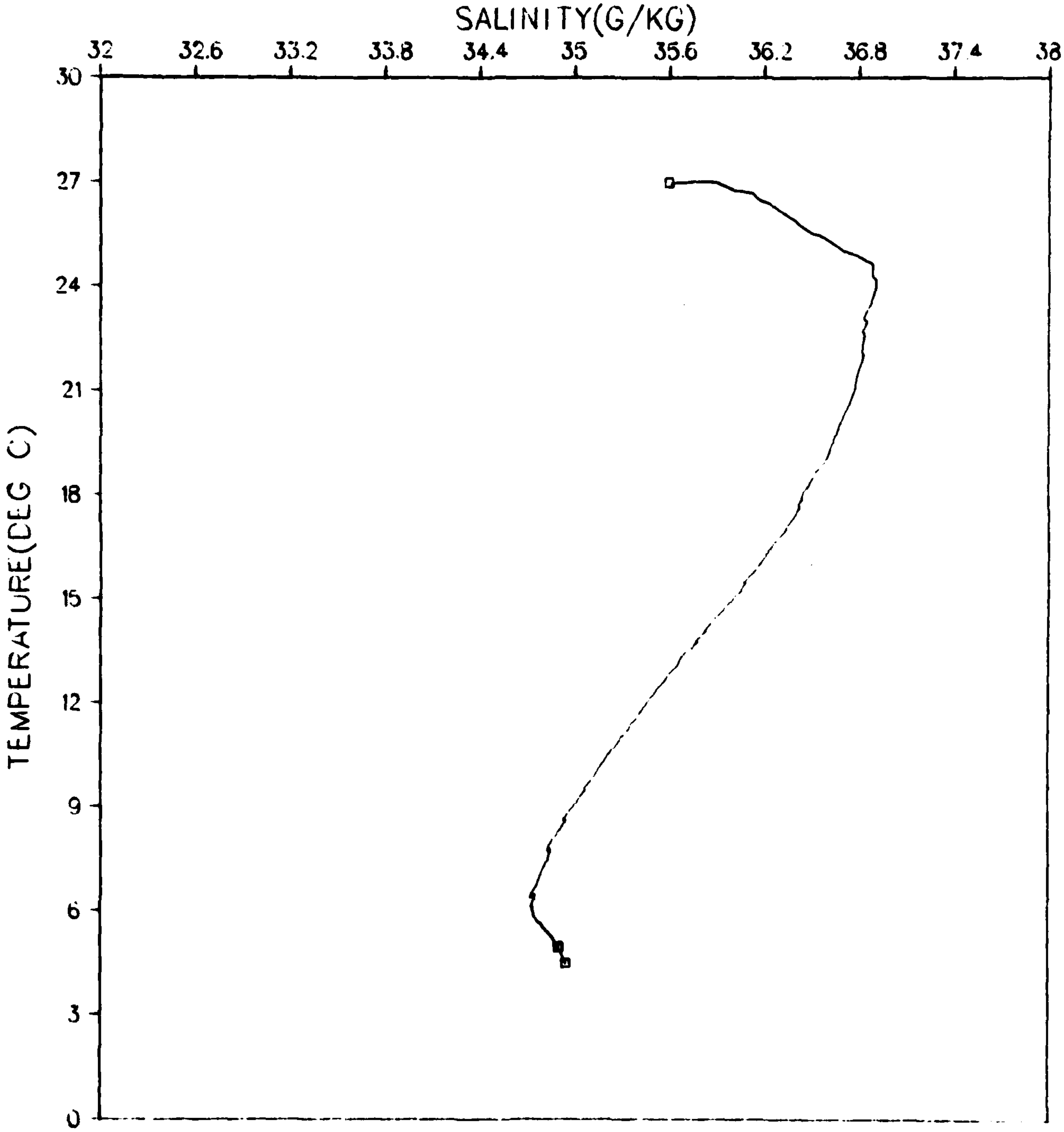


Figure 196.

GRENADA BASIN
STATION 095001
JANUARY 1980

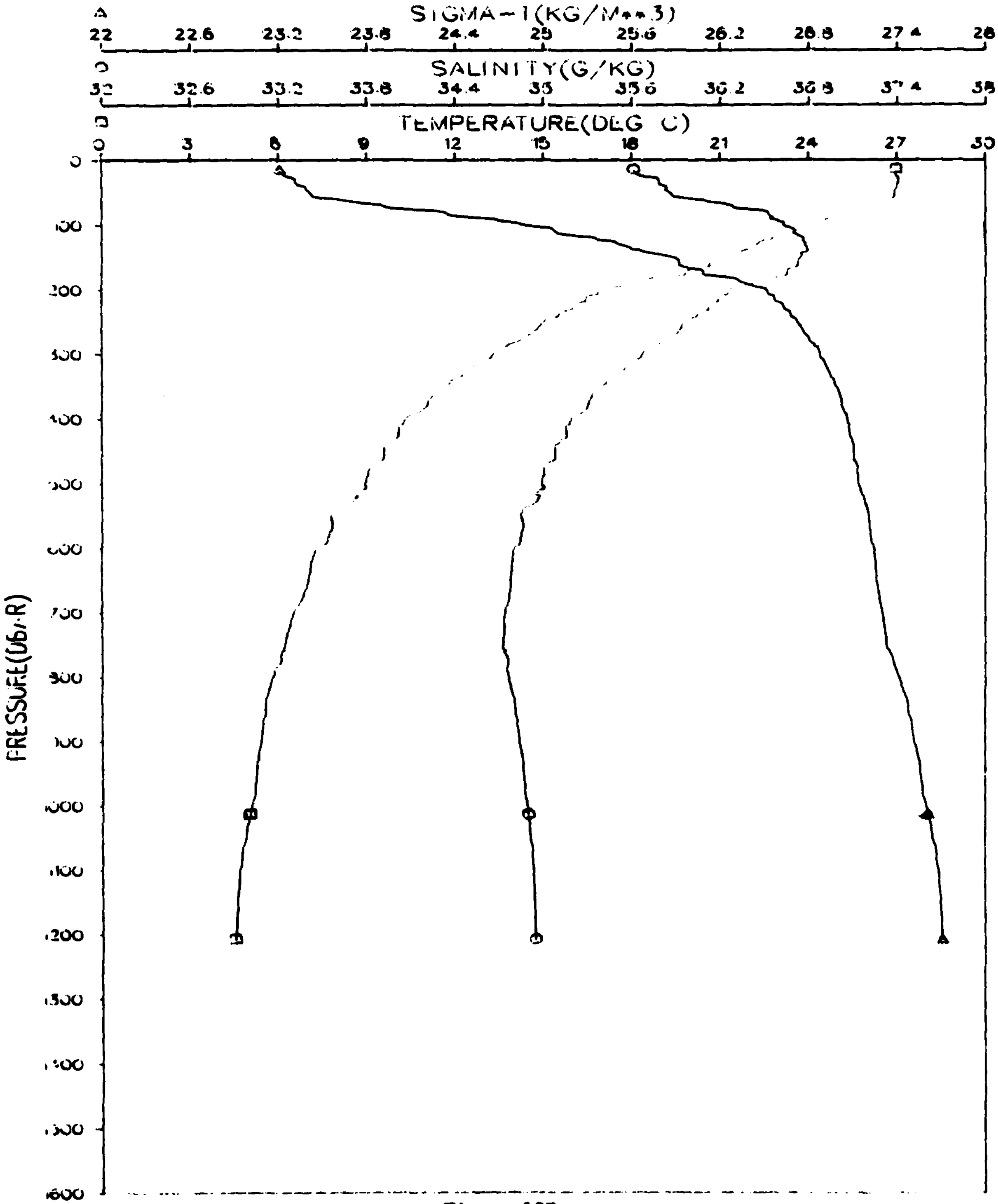


Figure 197.

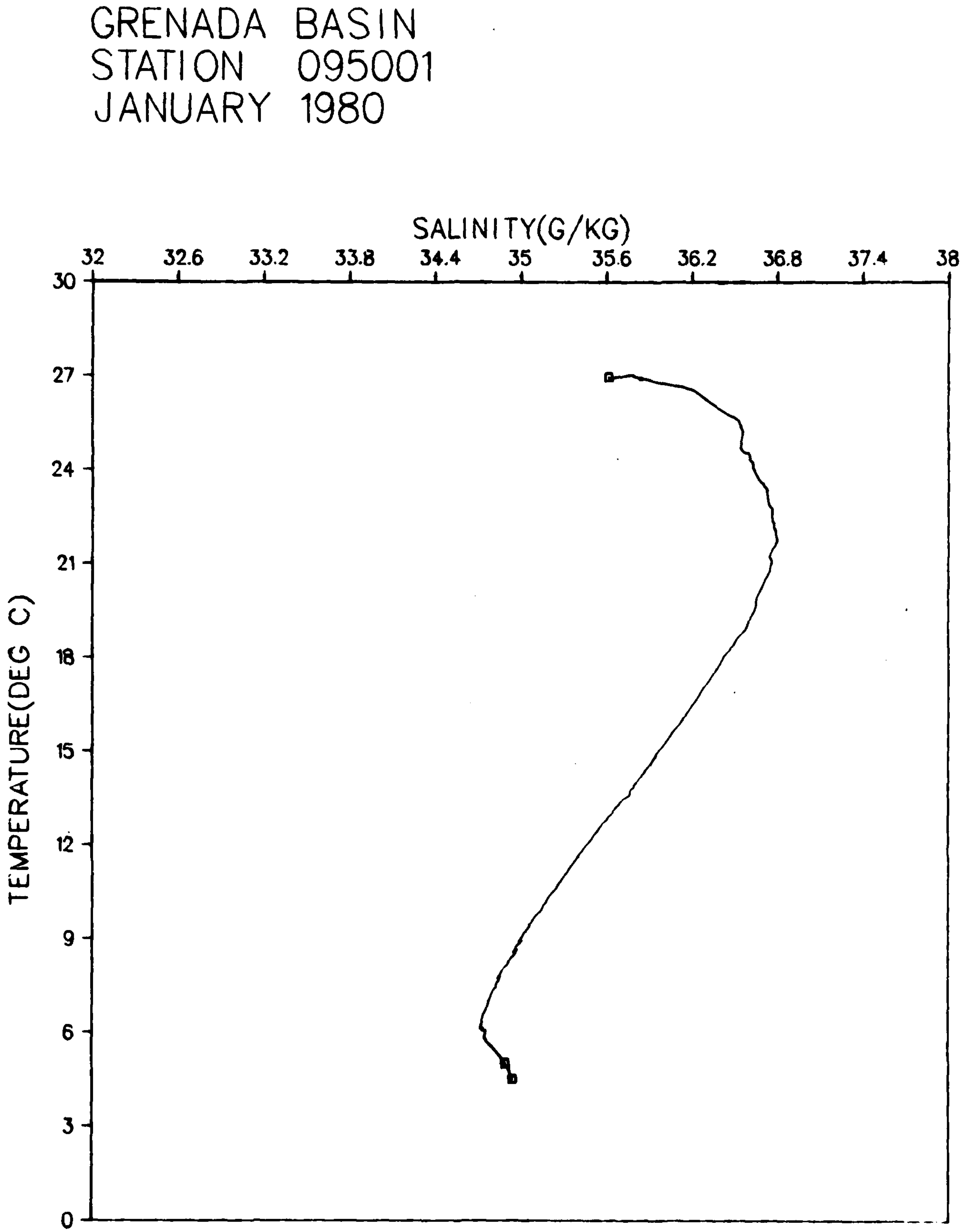

GRENADA BASIN
STATION 095001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 198.

GRENADA BASIN
STATION 096001
JANUARY 1980

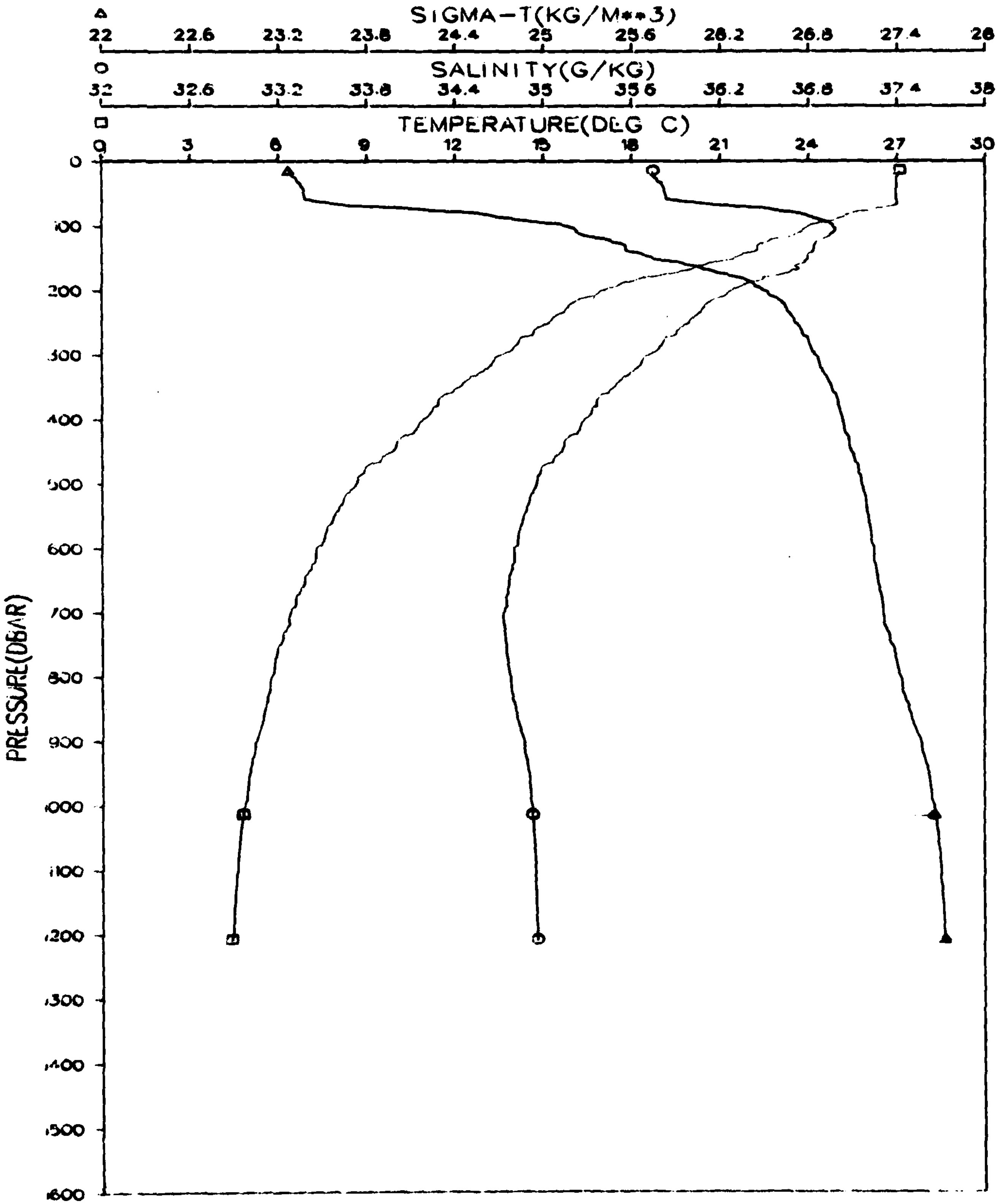


Figure 199.

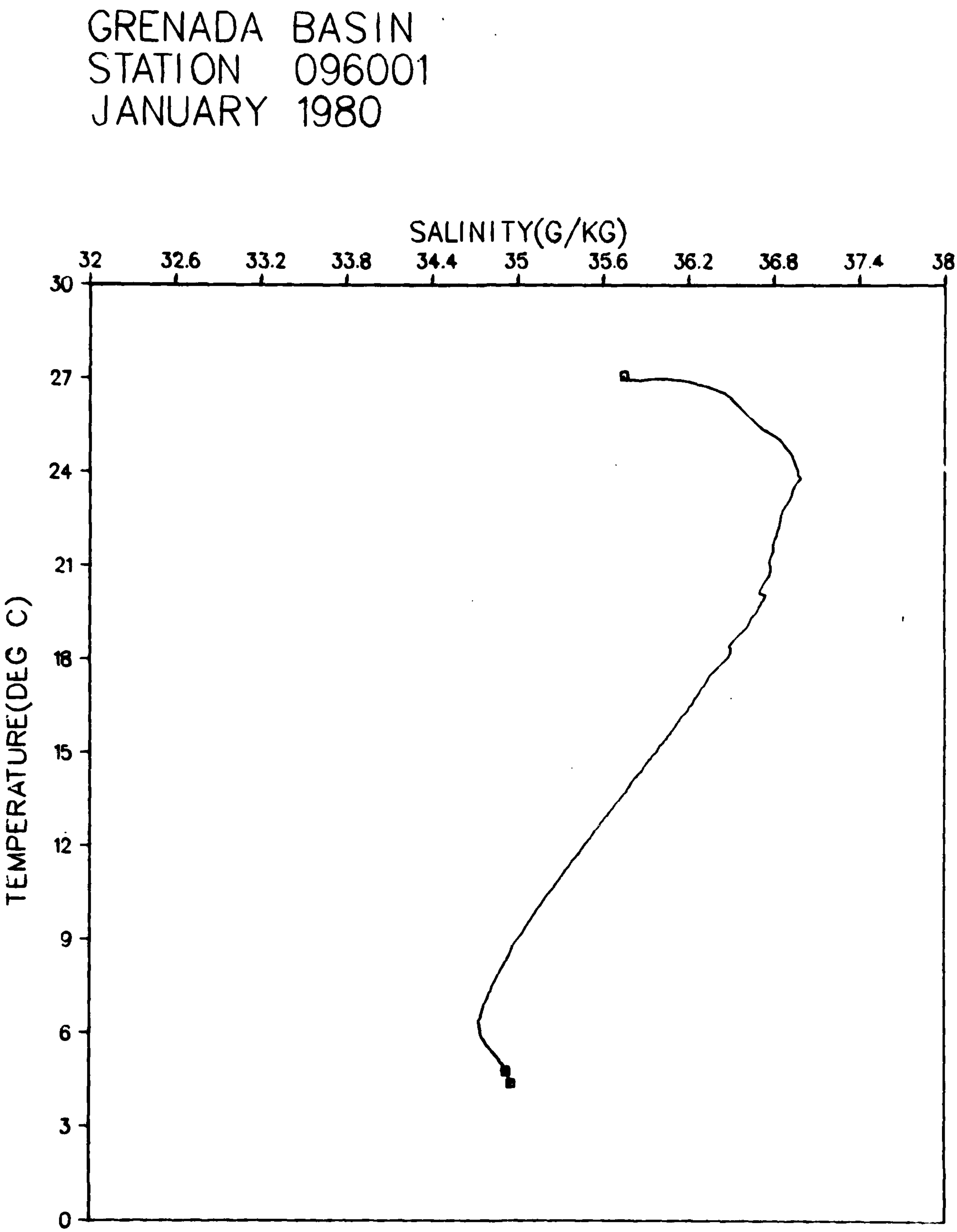

GRENADA BASIN
STATION 096001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 200.

GRENADA BASIN
STATION 097001
JANUARY 1980

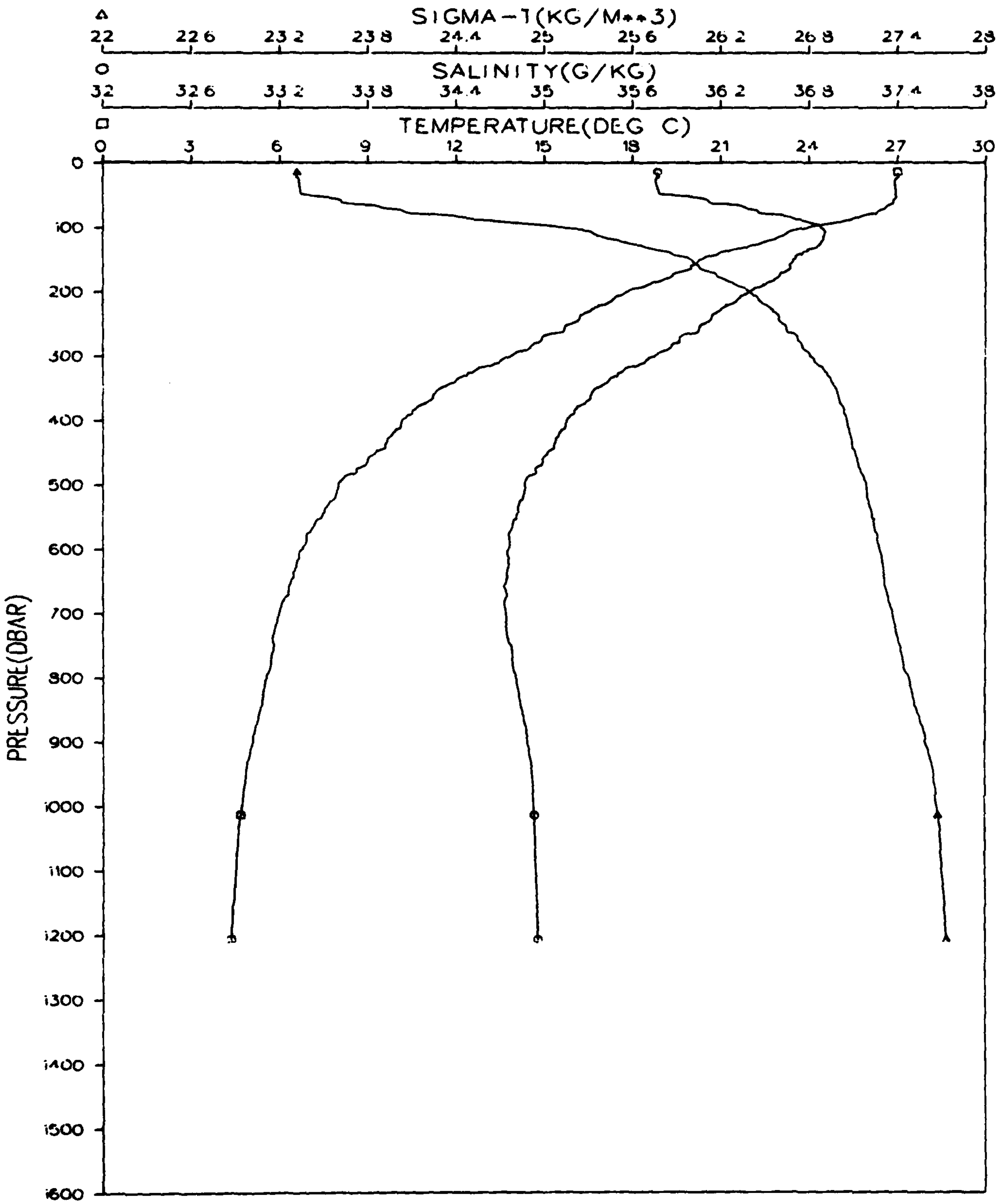


Figure 201.

GRENADA BASIN
STATION 097001
JANUARY 1980

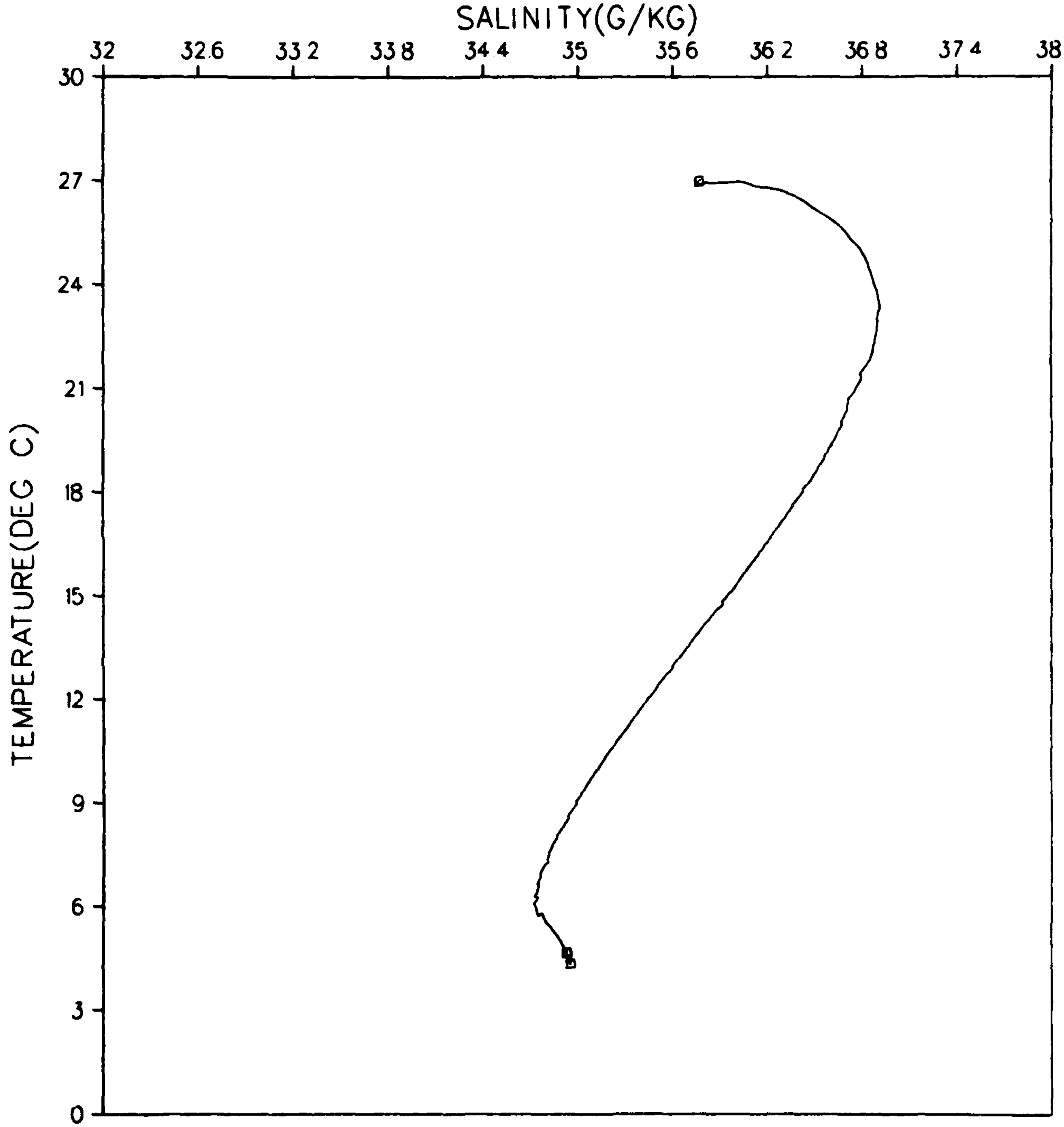


Figure 202.

GRENADA BASIN
STATION 098001
JANUARY 1980

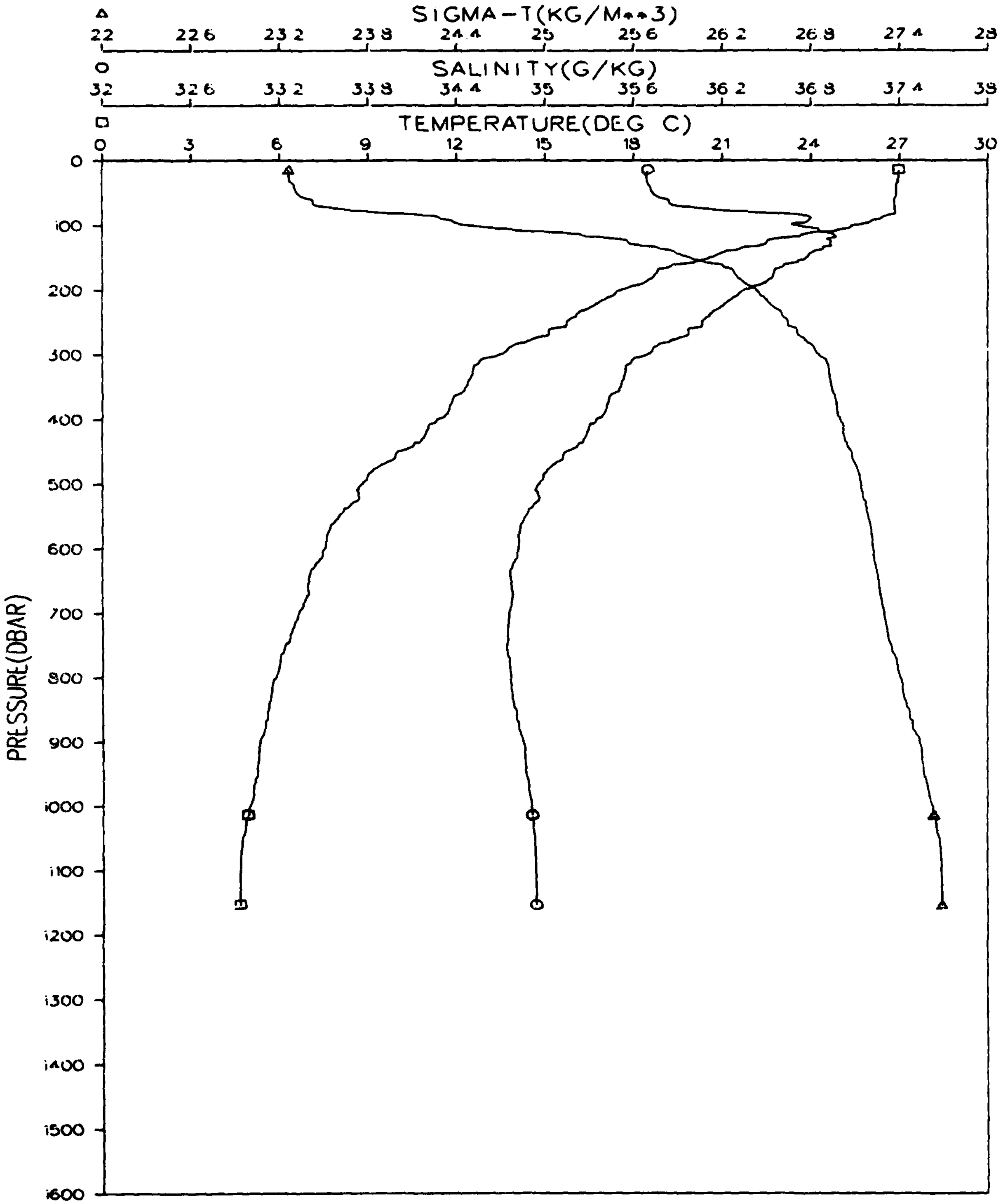


Figure 203.

GRENADA BASIN
STATION 098001
JANUARY 1980

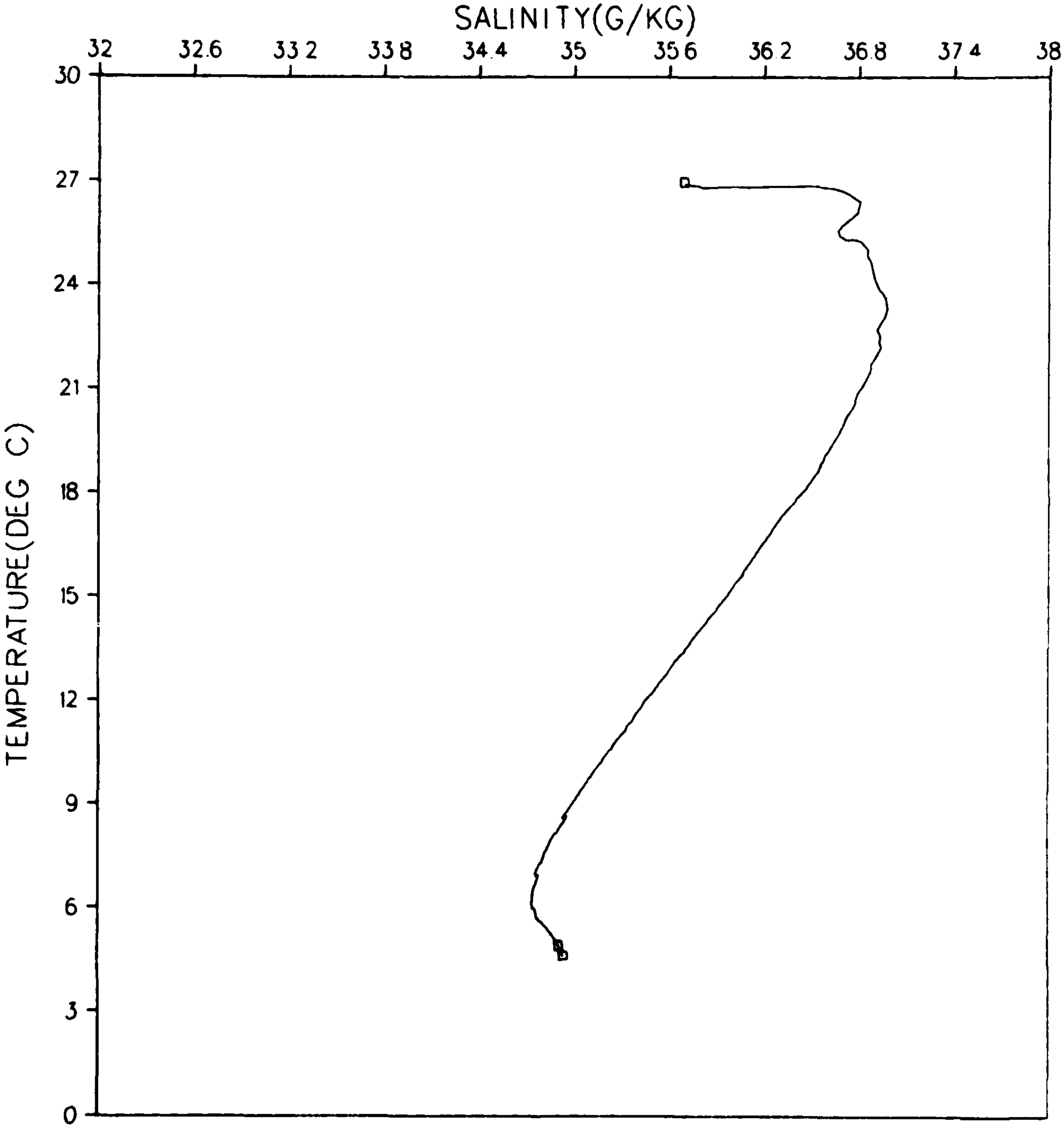


Figure 204.

GRENADA BASIN
STATION 099001
JANUARY 1980

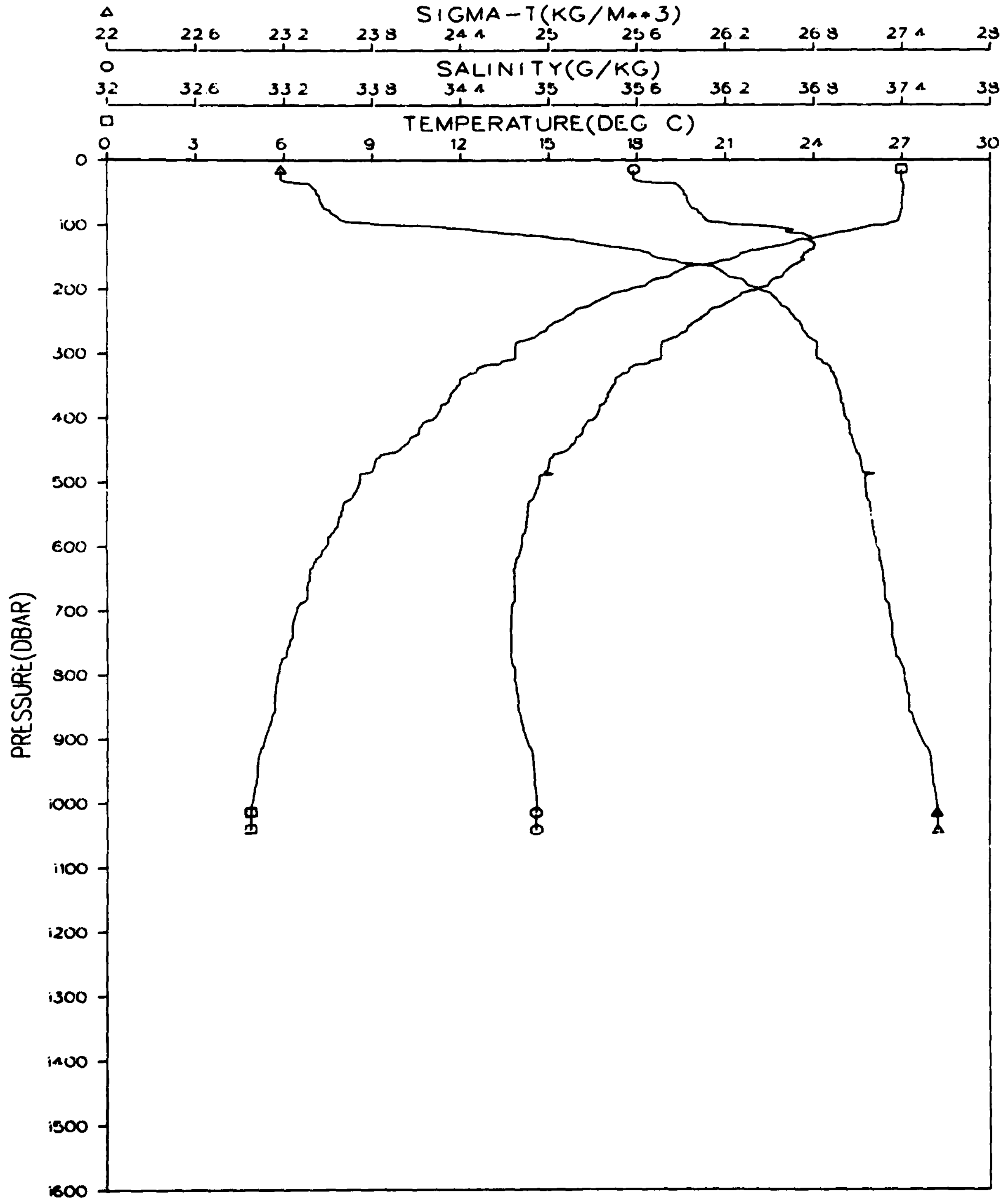


Figure 205.

GRENADA BASIN
STATION 099001
JANUARY 1980

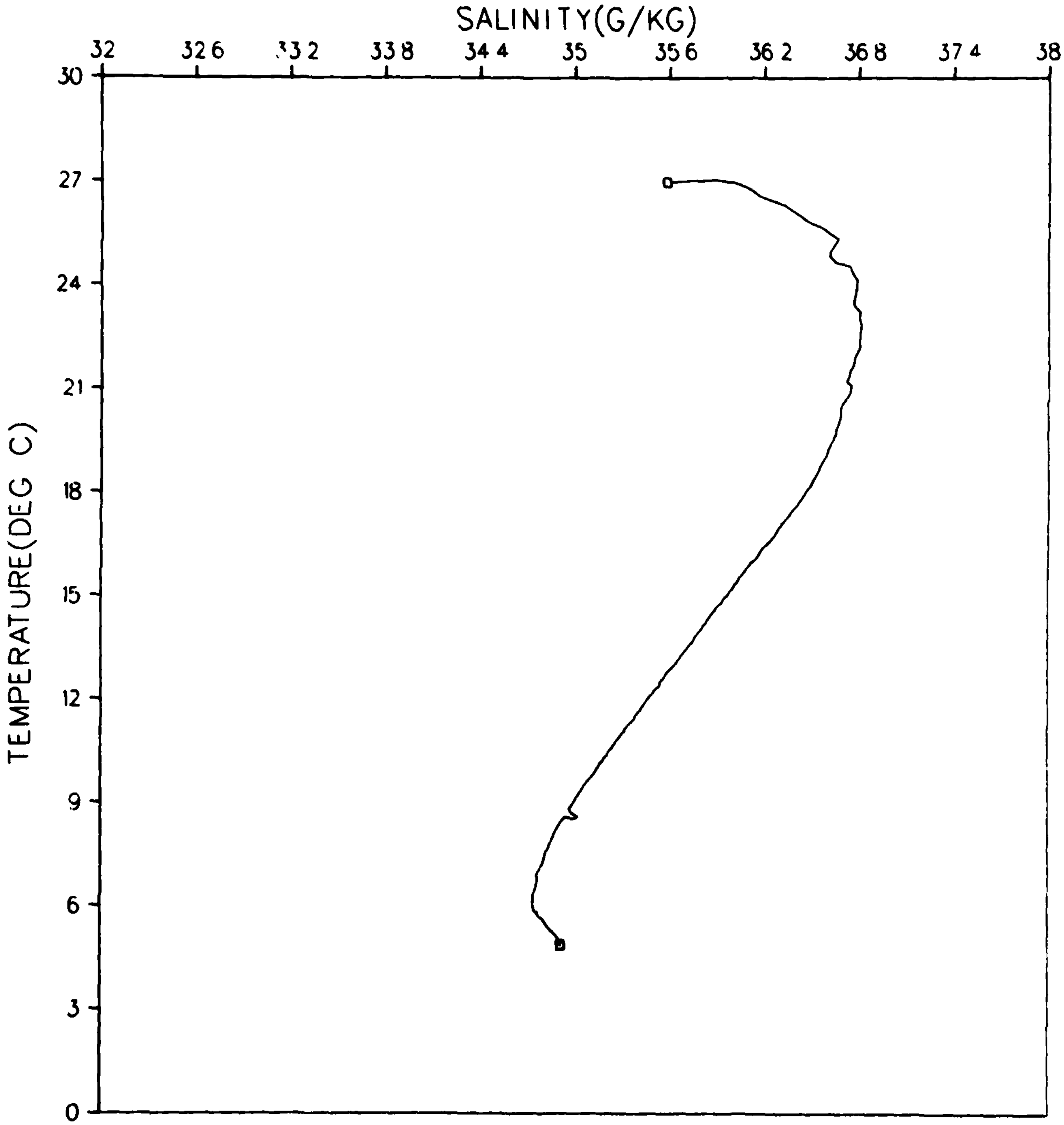


Figure 206.

GRENADA BASIN
STATION 100001
JANUARY 1980

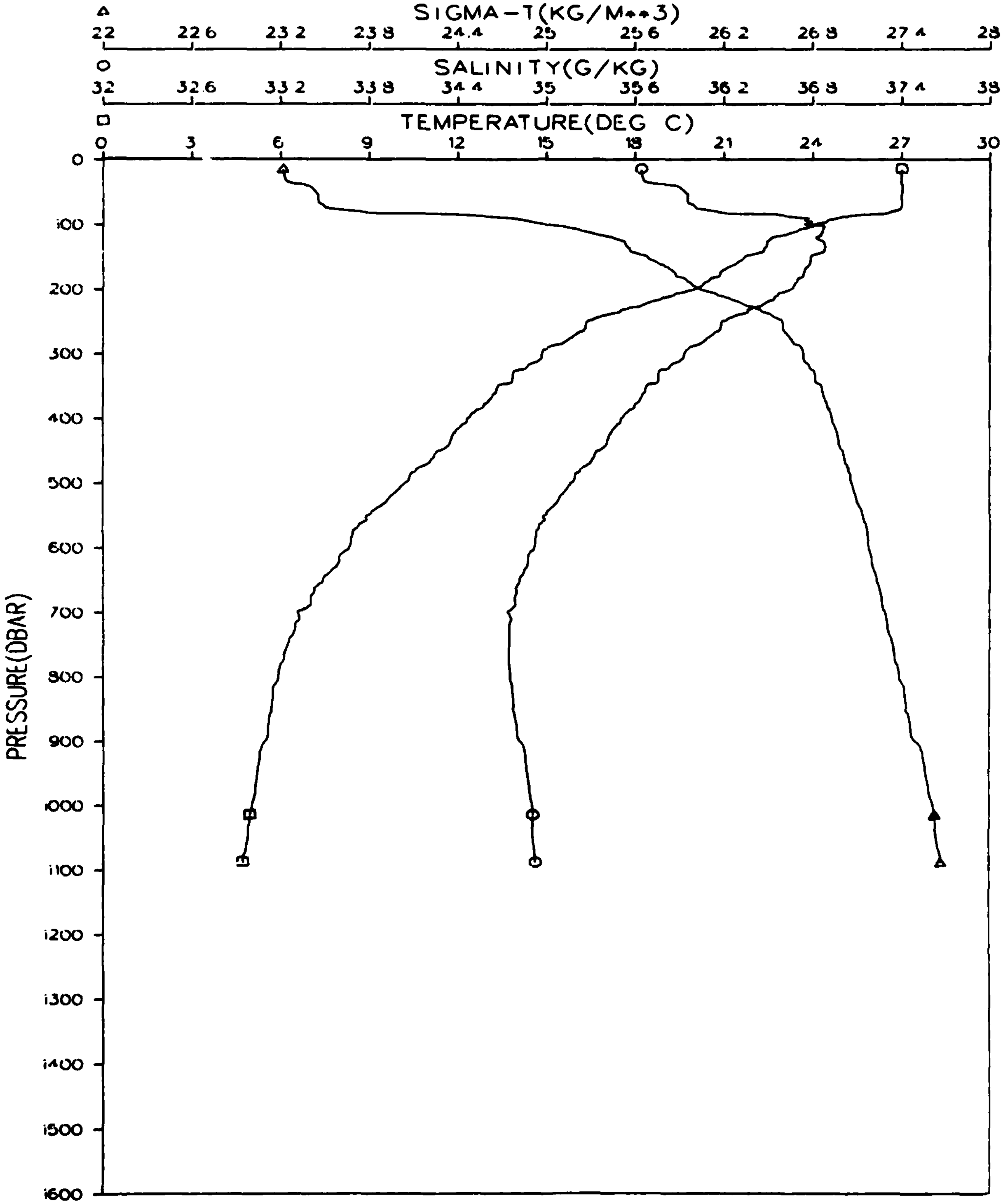


Figure 207.

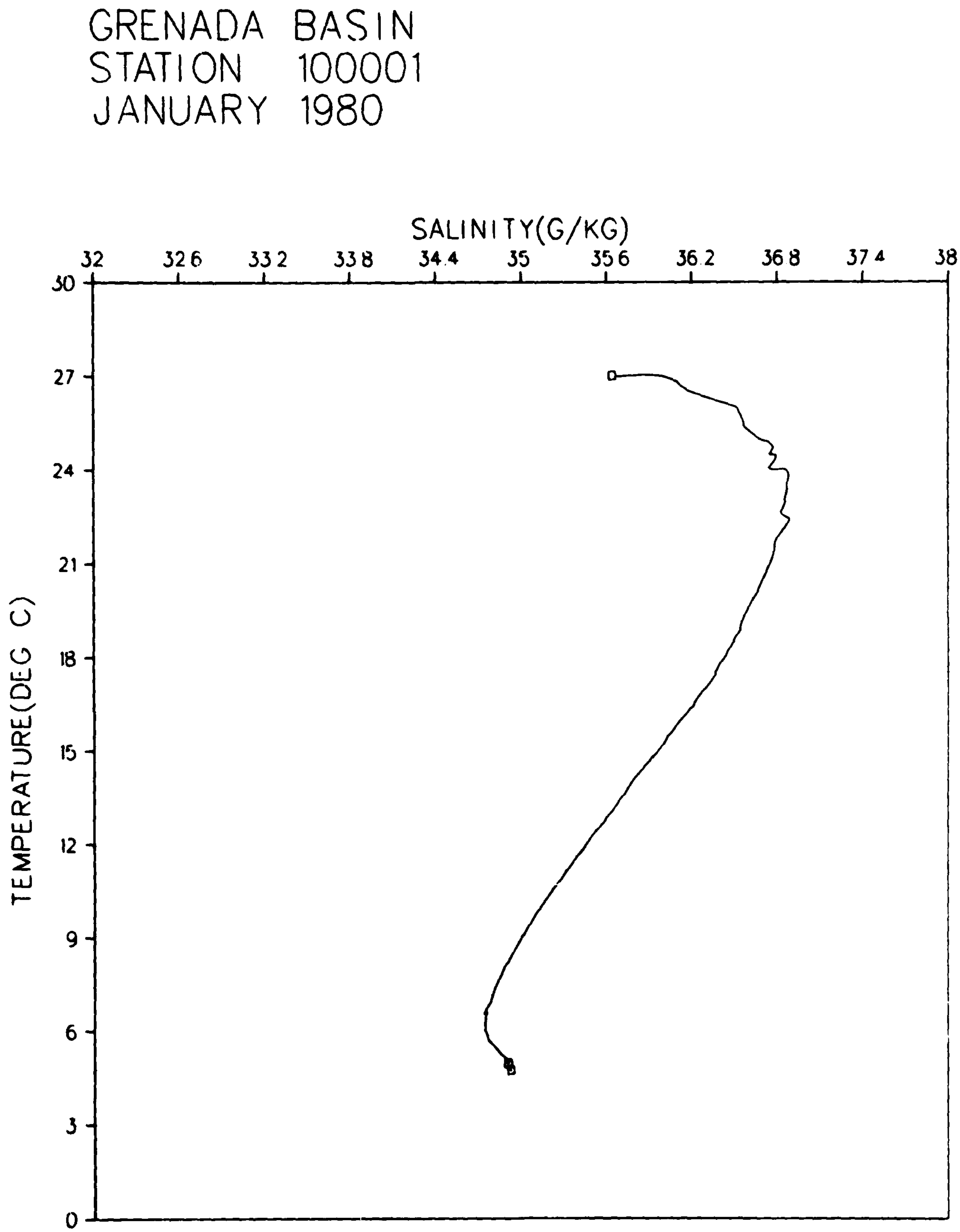

GRENADA BASIN
STATION 100001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 208.

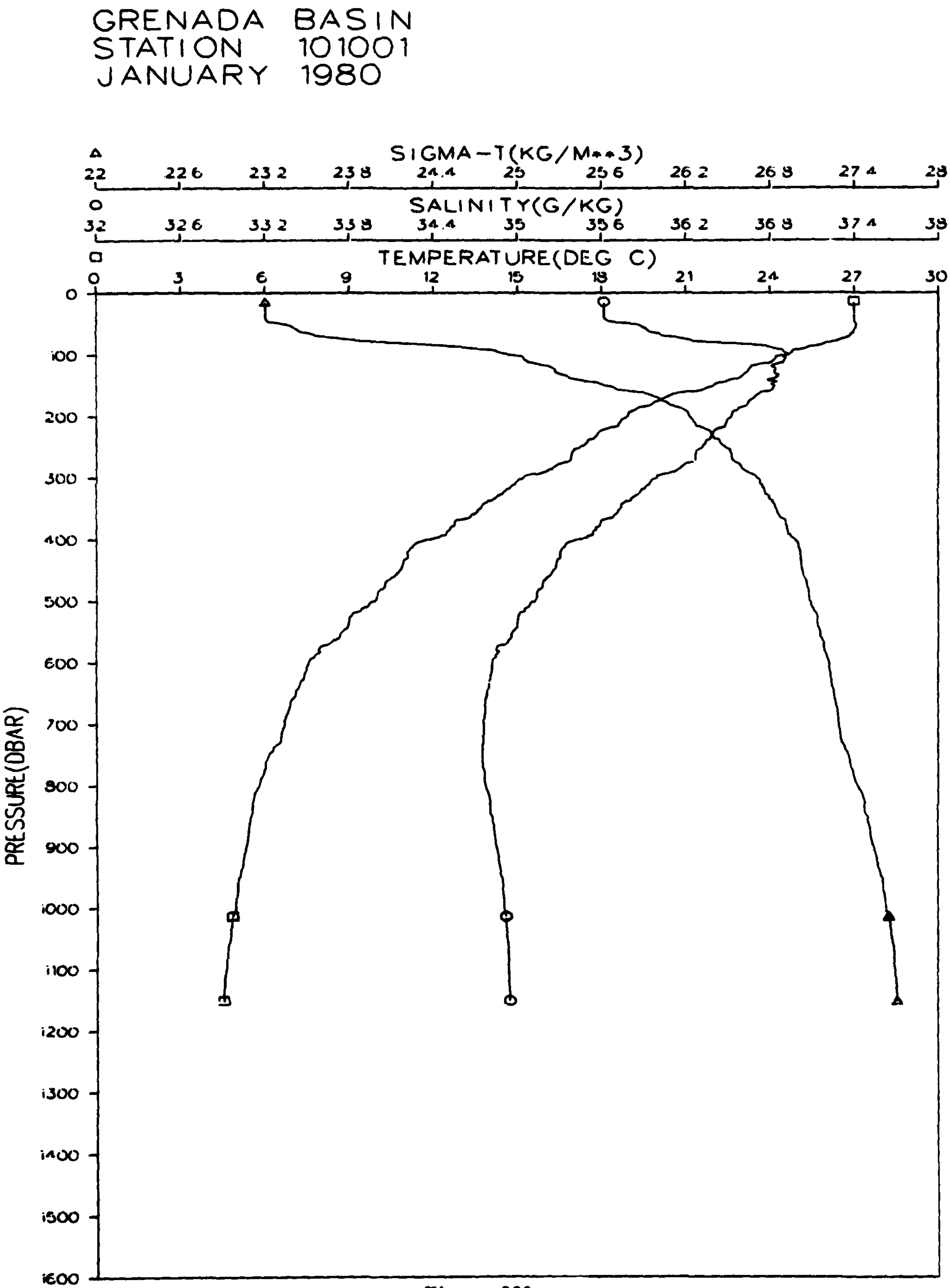

GRENADA BASIN
STATION 101001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 209.

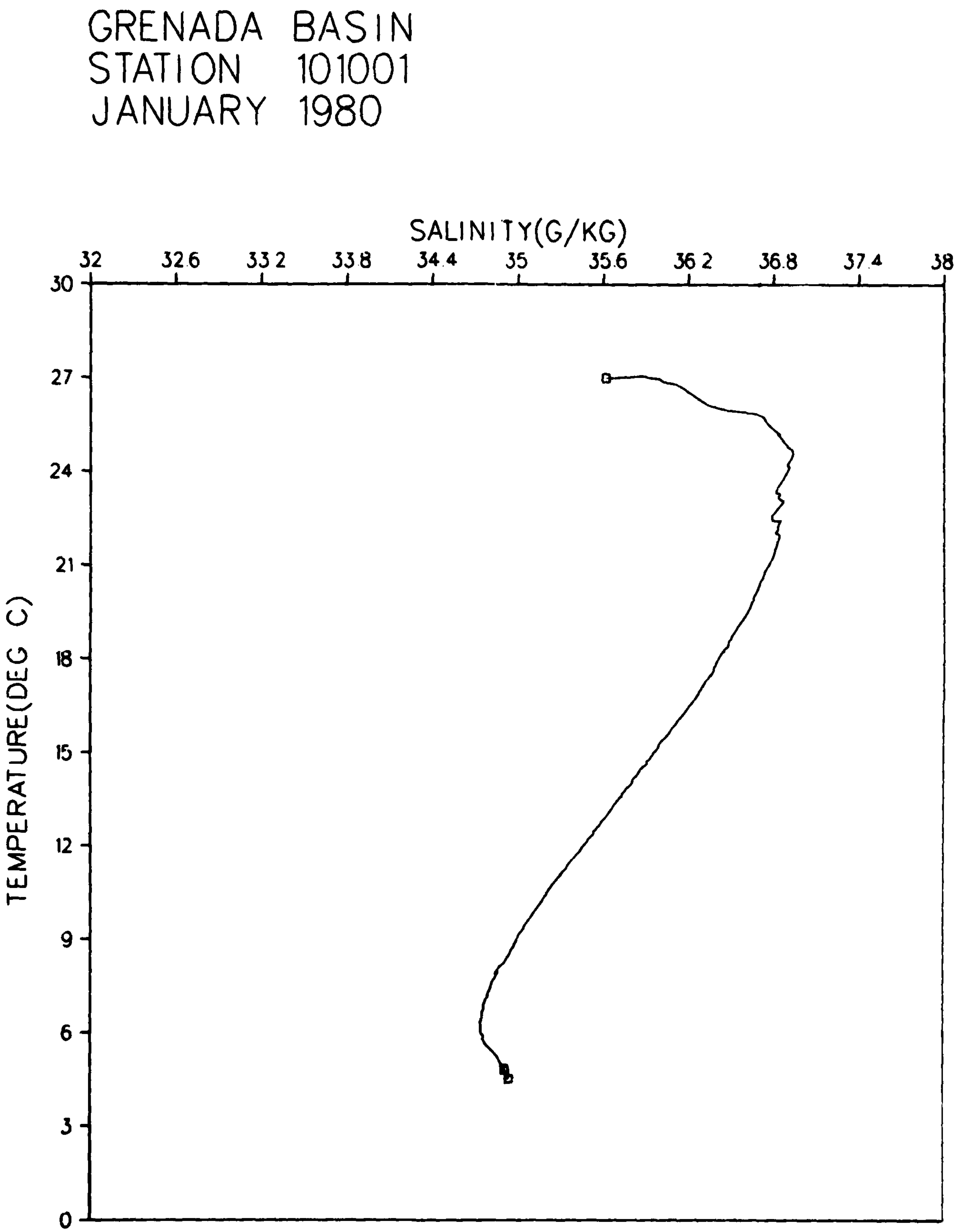

GRENADA BASIN
STATION 101001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 210.

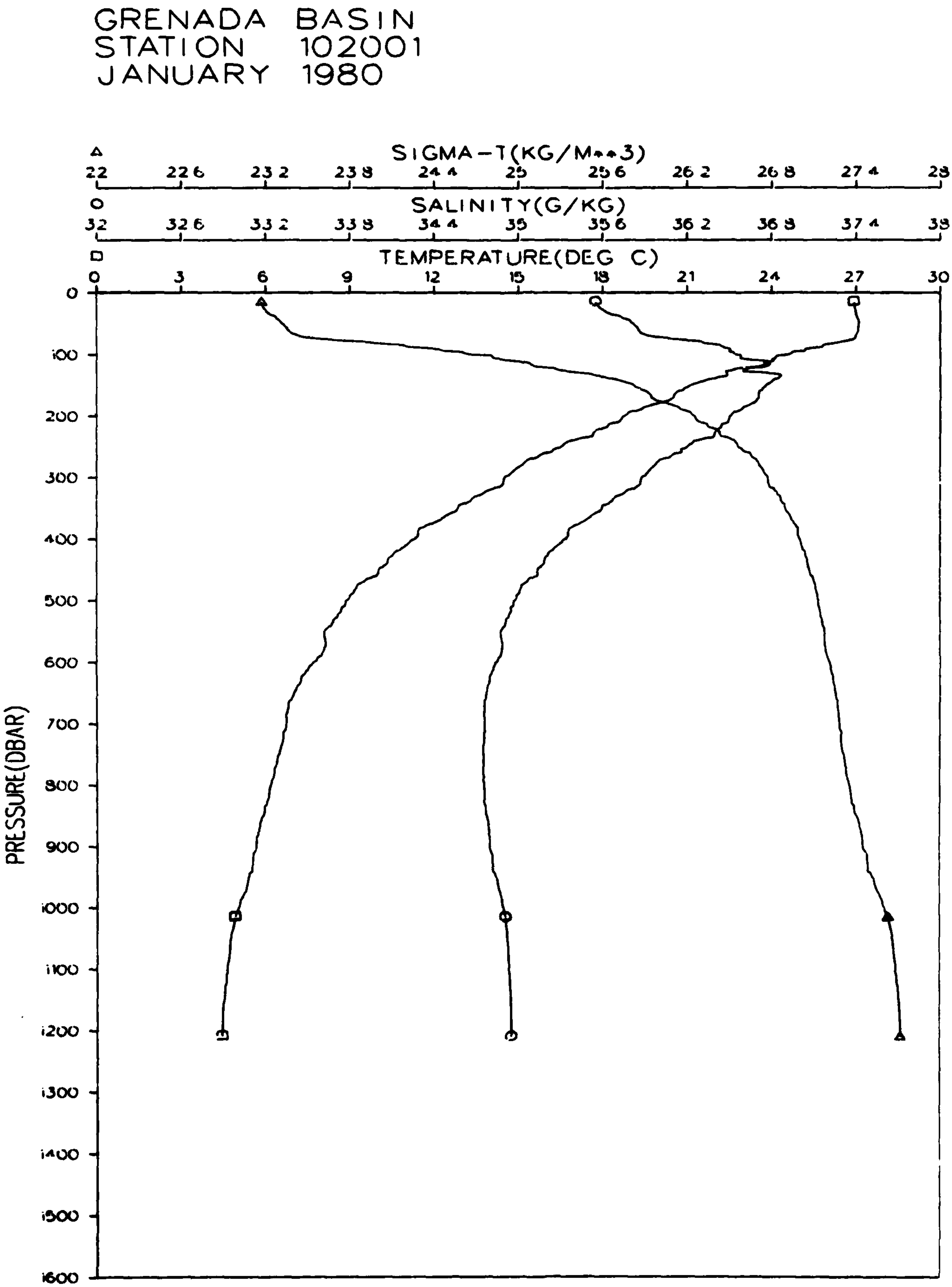

GRENADA BASIN
STATION 102001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 211.

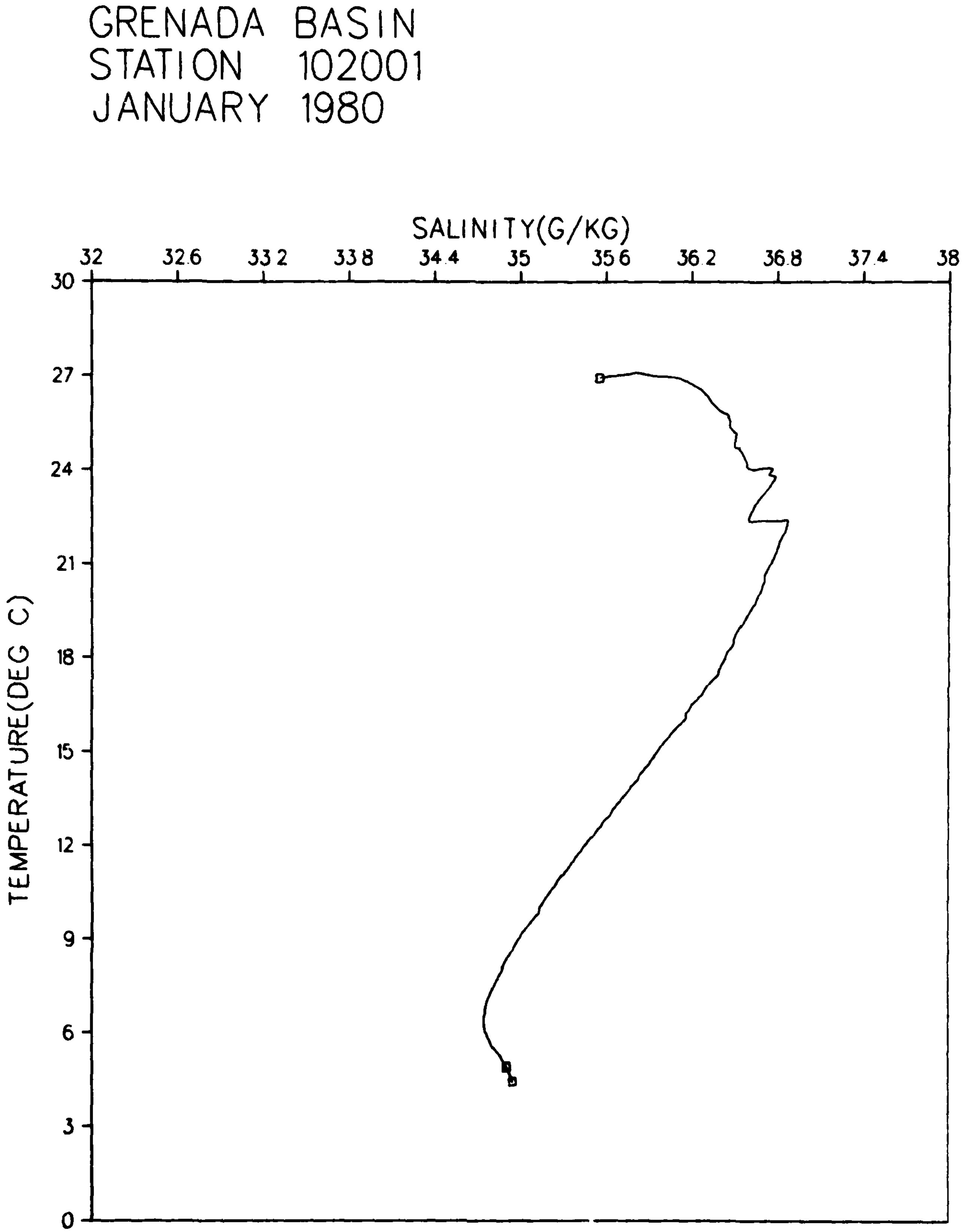

GRENADA BASIN
STATION 102001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 212.

GRENADA BASIN
STATION 103001
JANUARY 1980

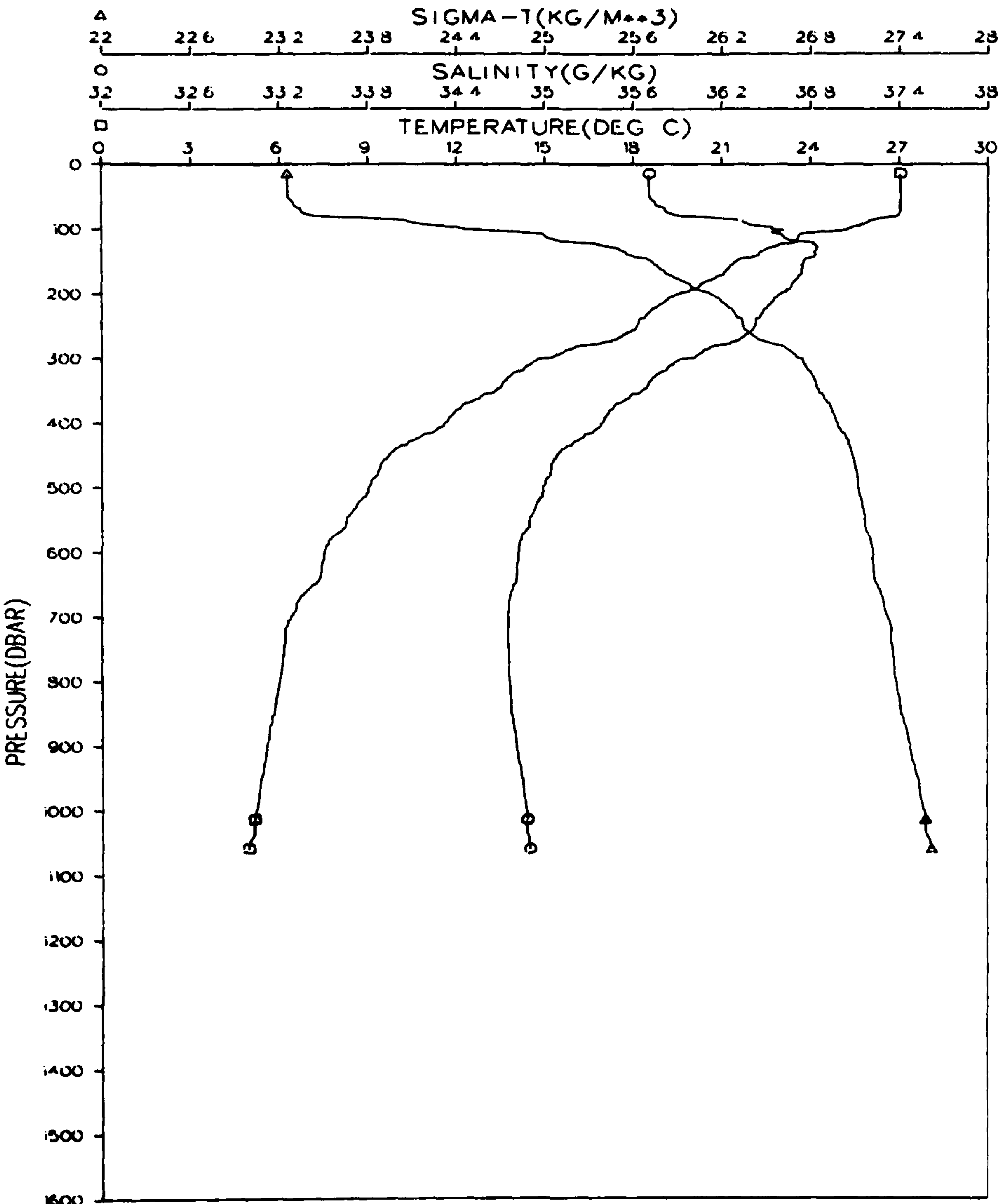


Figure 213.

GRENADA BASIN
STATION 103001
JANUARY 1980

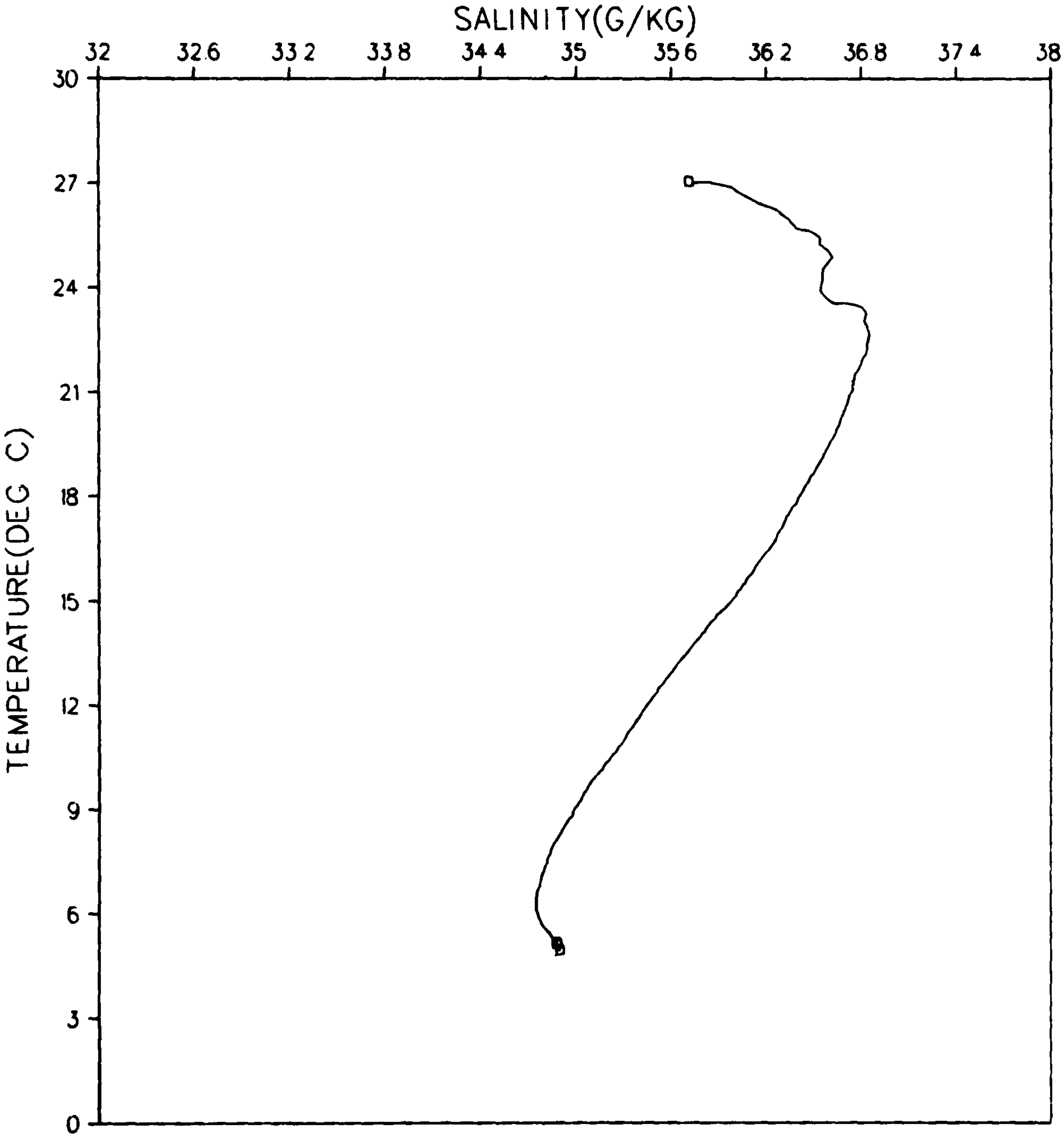


Figure 214.

GRENADA BASIN
STATION 104001
JANUARY 1980

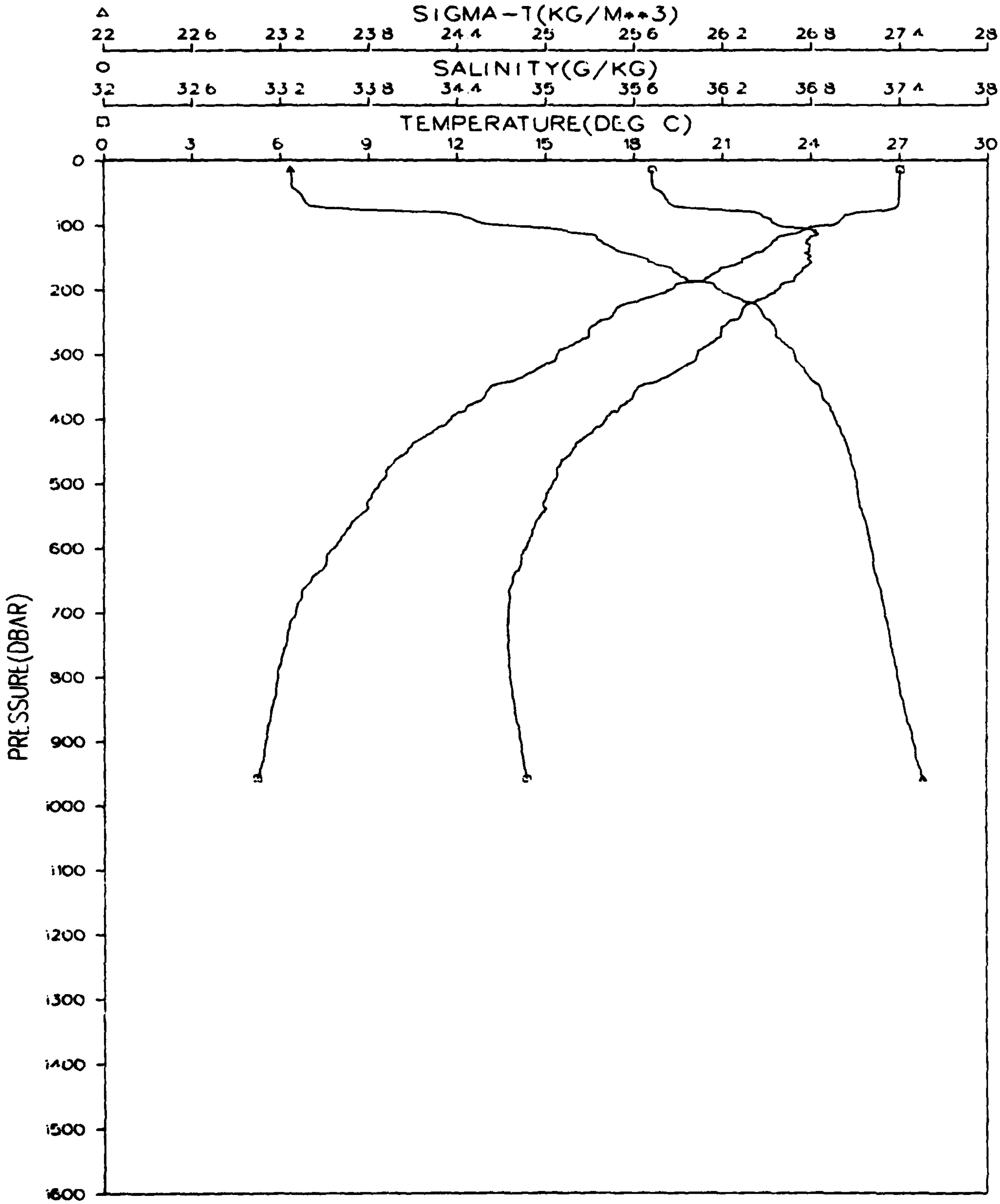


Figure 215.

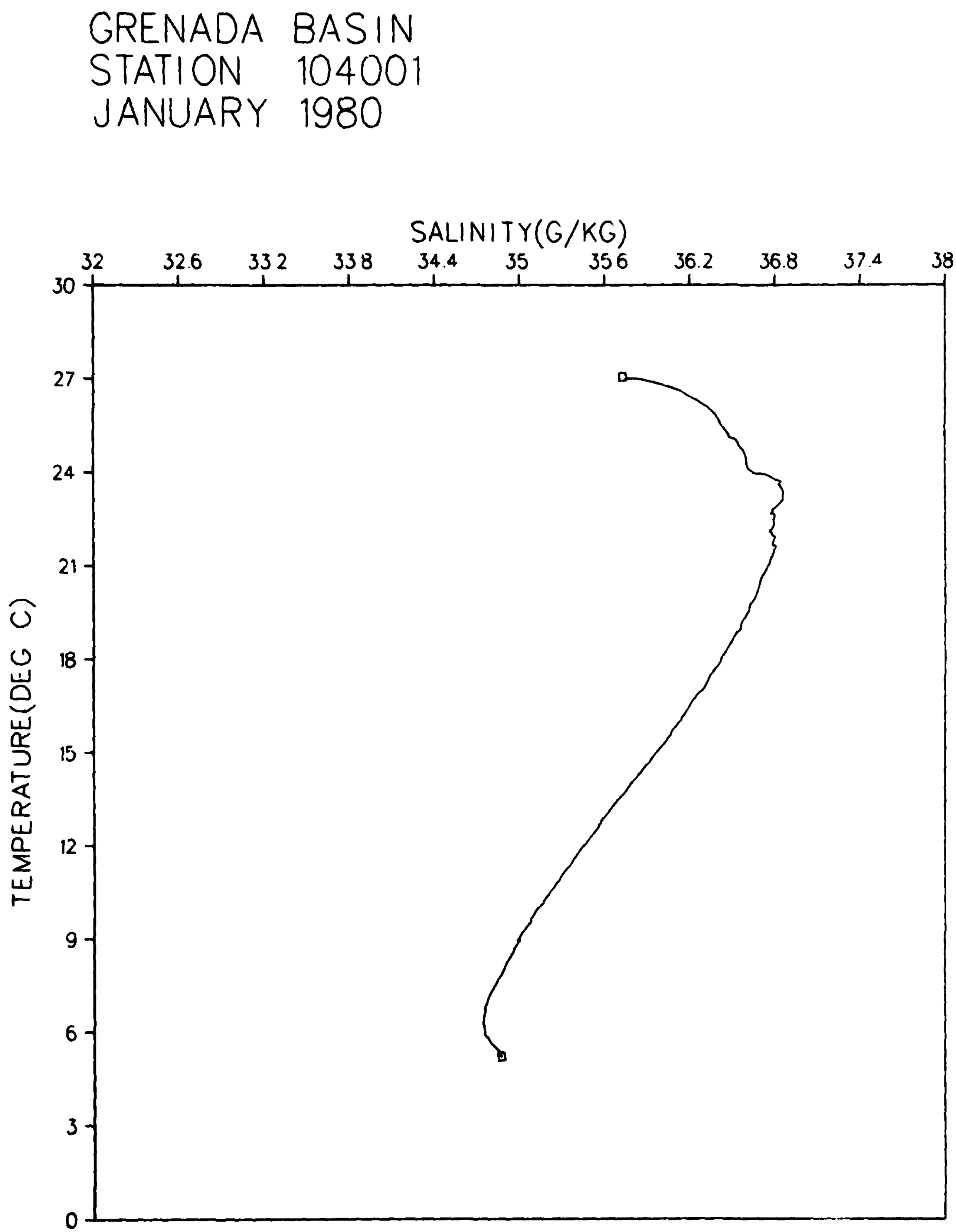

GRENADA BASIN
STATION 104001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 216.

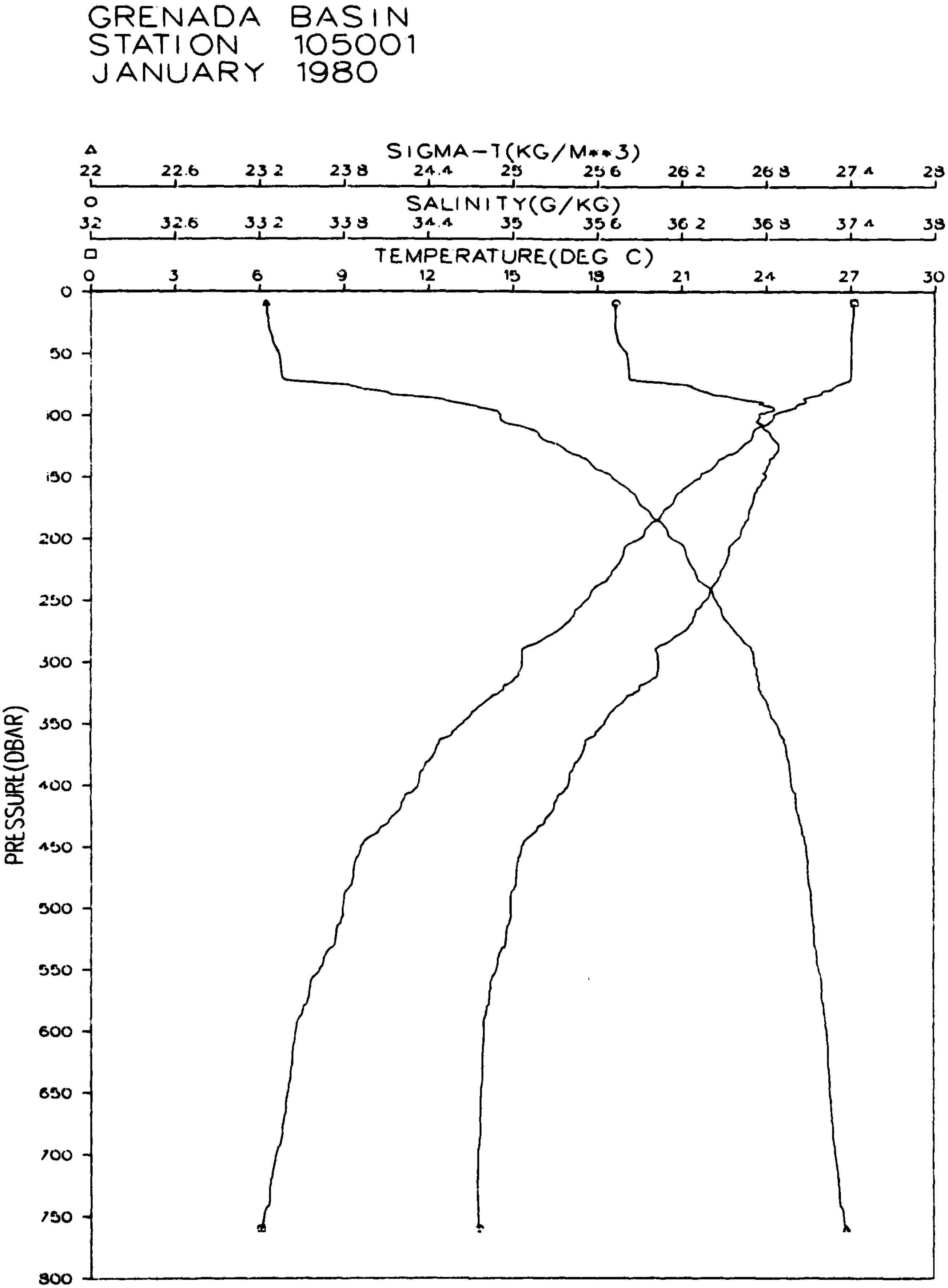

GRENADA BASIN
STATION 105001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800

Figure 217.

GRENADA BASIN
STATION 105001
JANUARY 1980

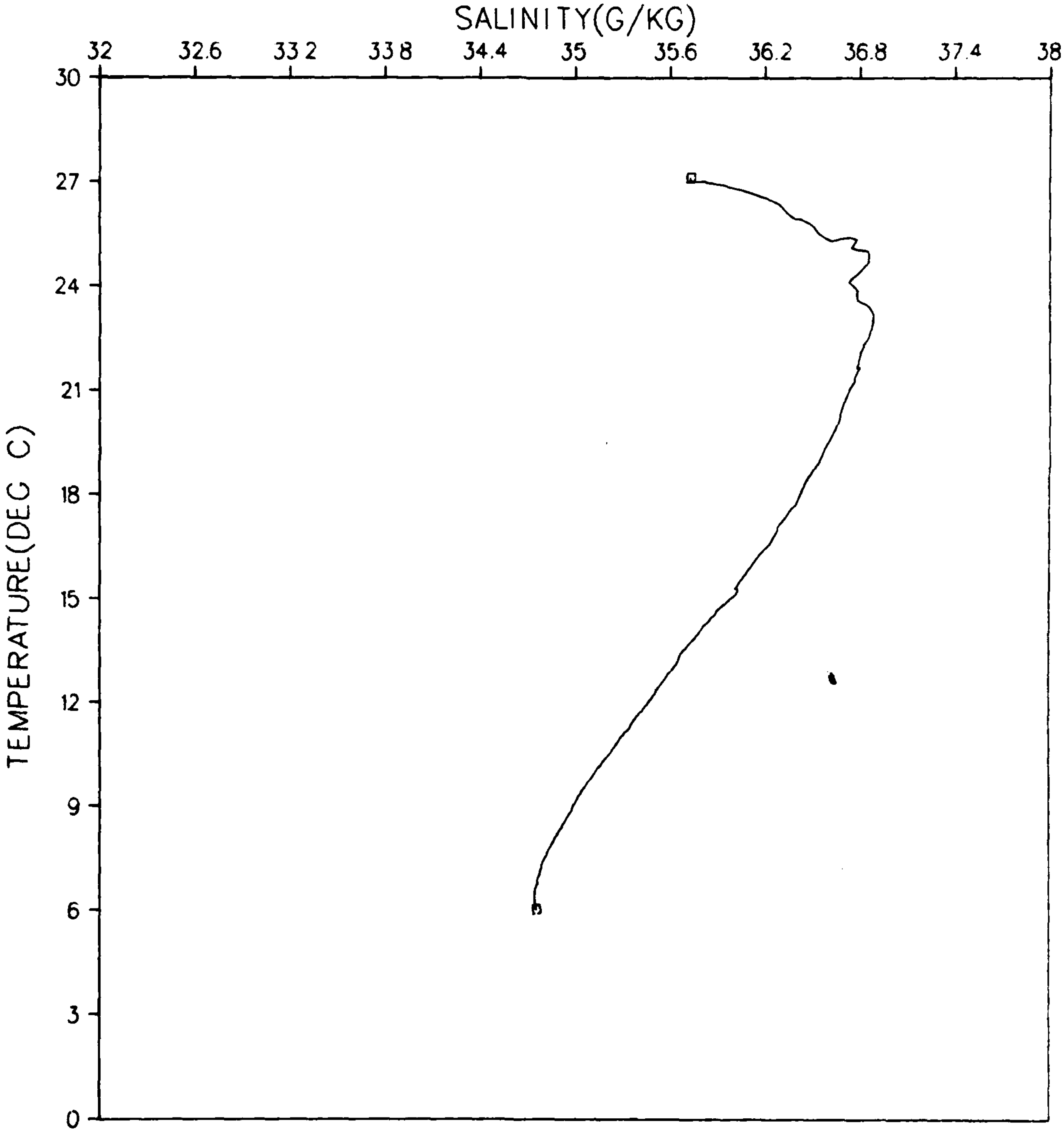


Figure 218.

GRENADA BASIN
STATION 106001
JANUARY 1980

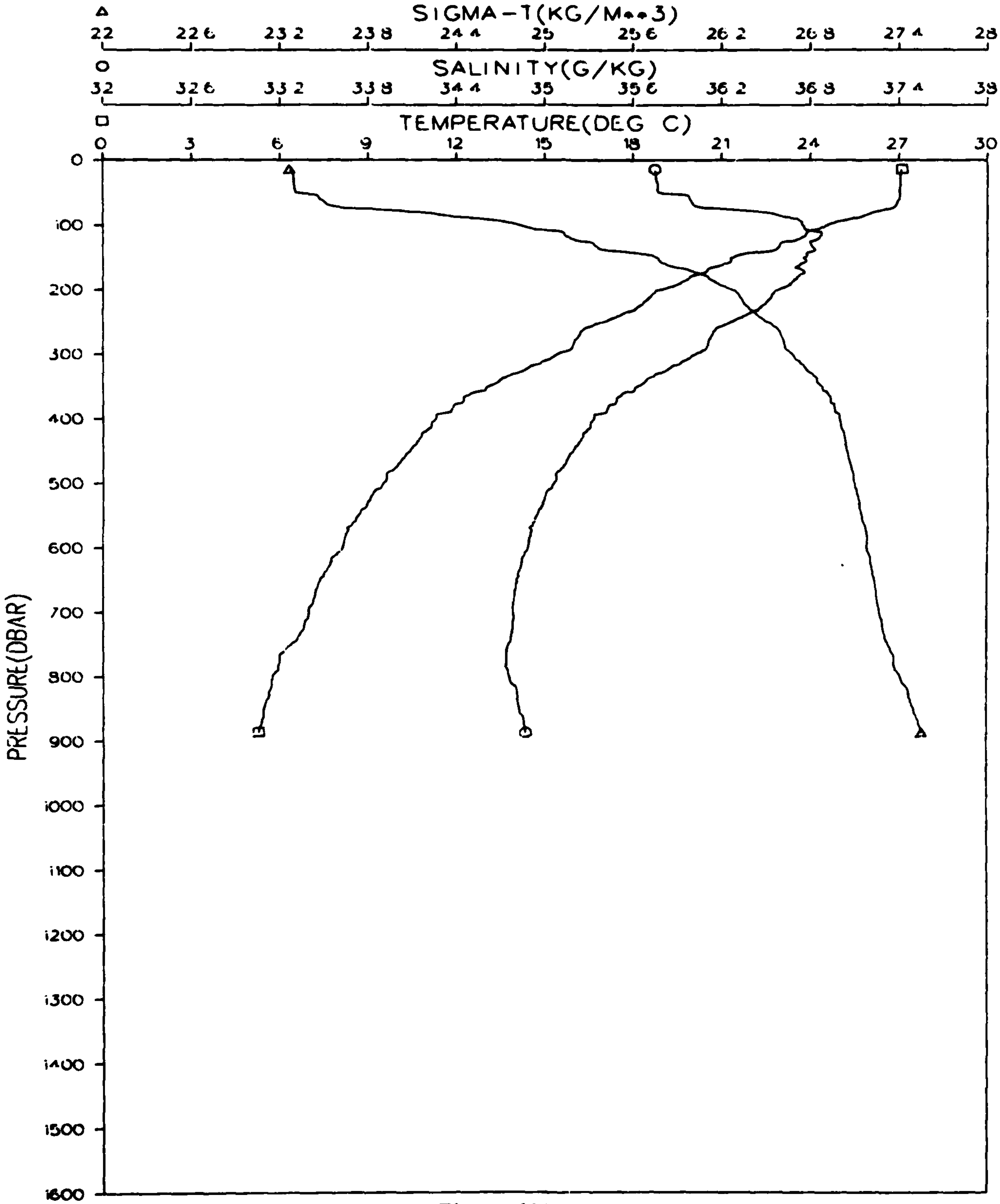


Figure 219.

GRENADA BASIN
STATION 106001
JANUARY 1980

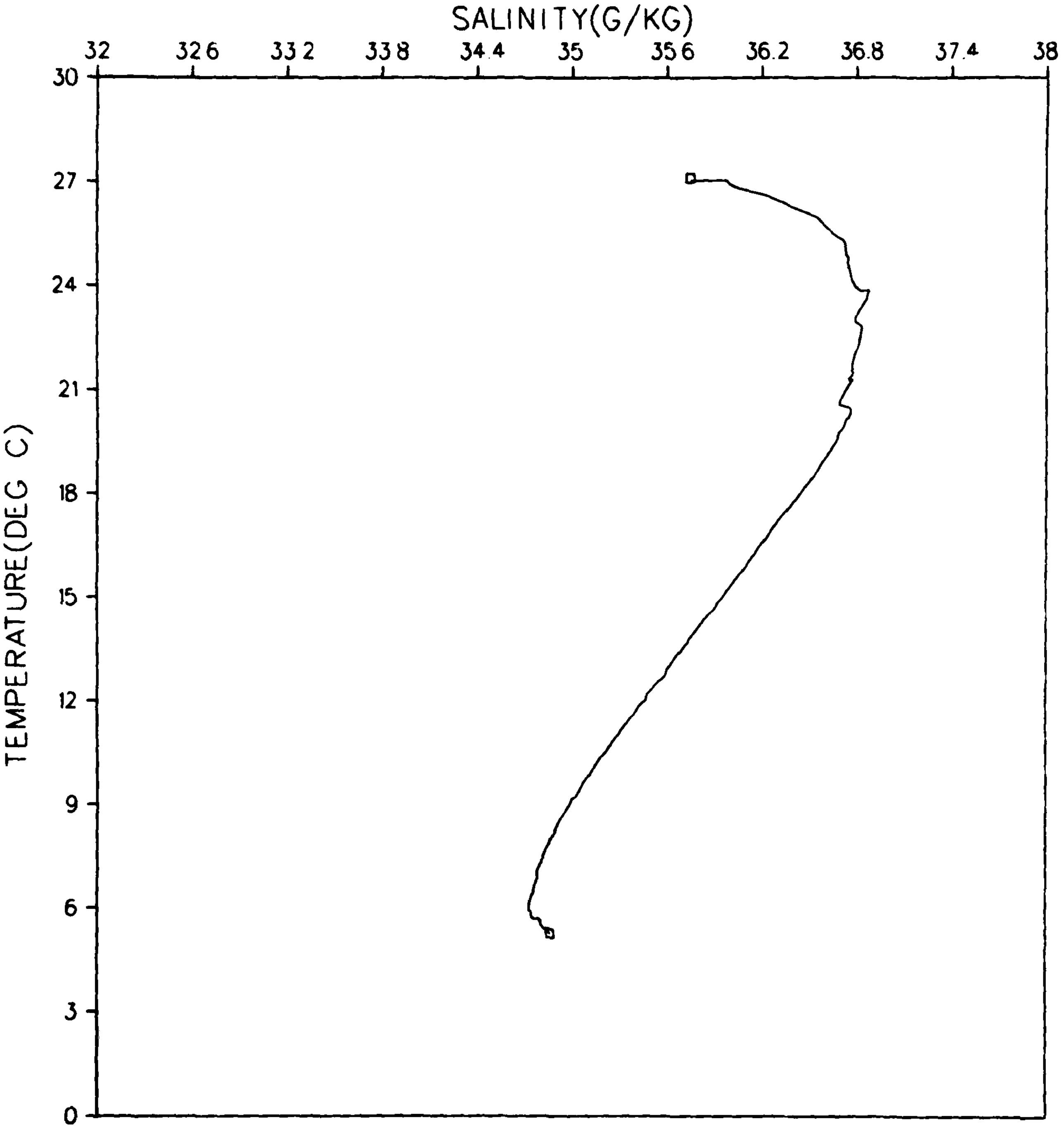


Figure 220.

GRENADA BASIN
STATION 107001
JANUARY 1980

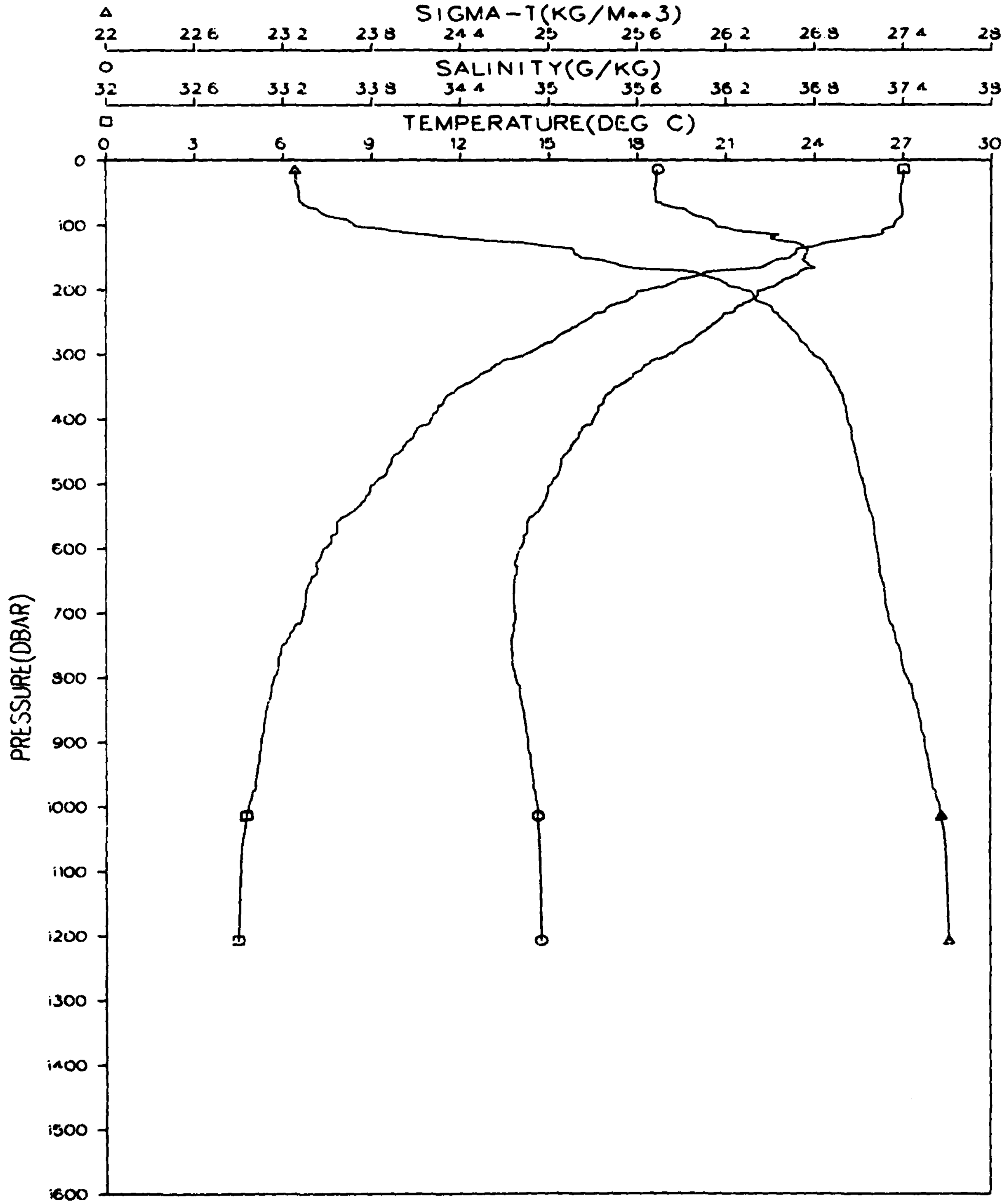


Figure 221.

GRENADA BASIN
STATION 107001
JANUARY 1980

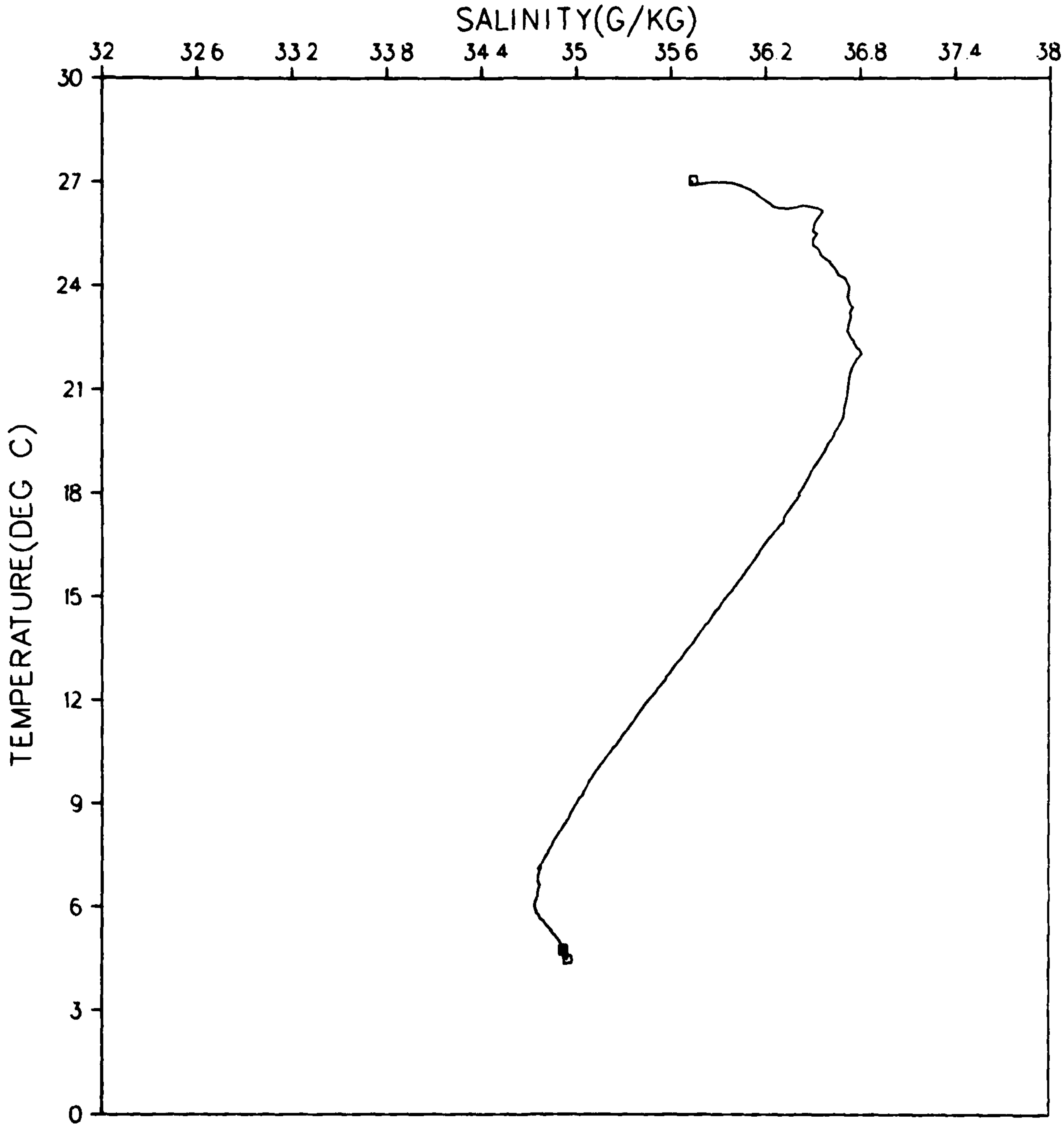


Figure 222.

GRENADA BASIN
STATION 108001
JANUARY 1980

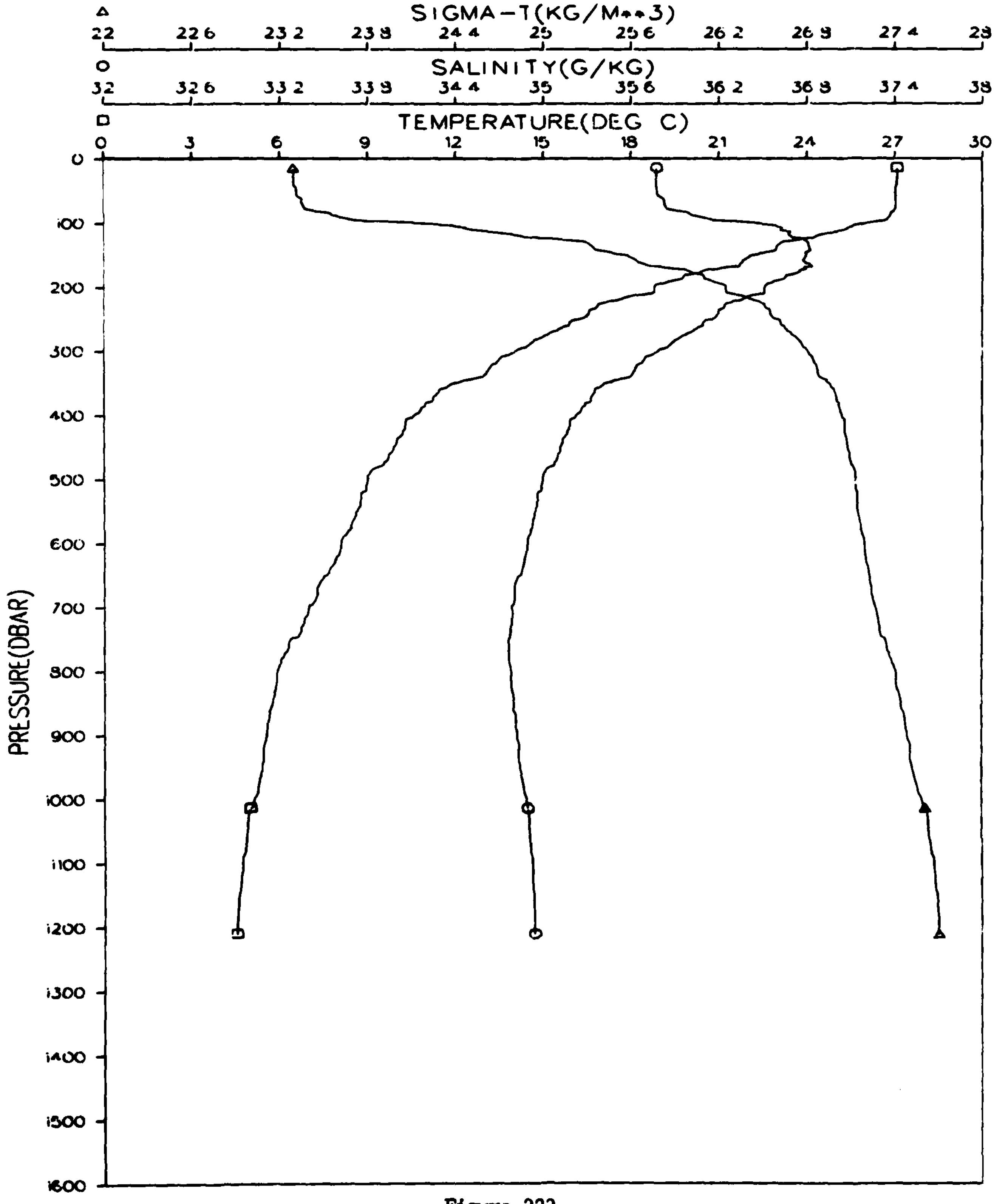


Figure 223.

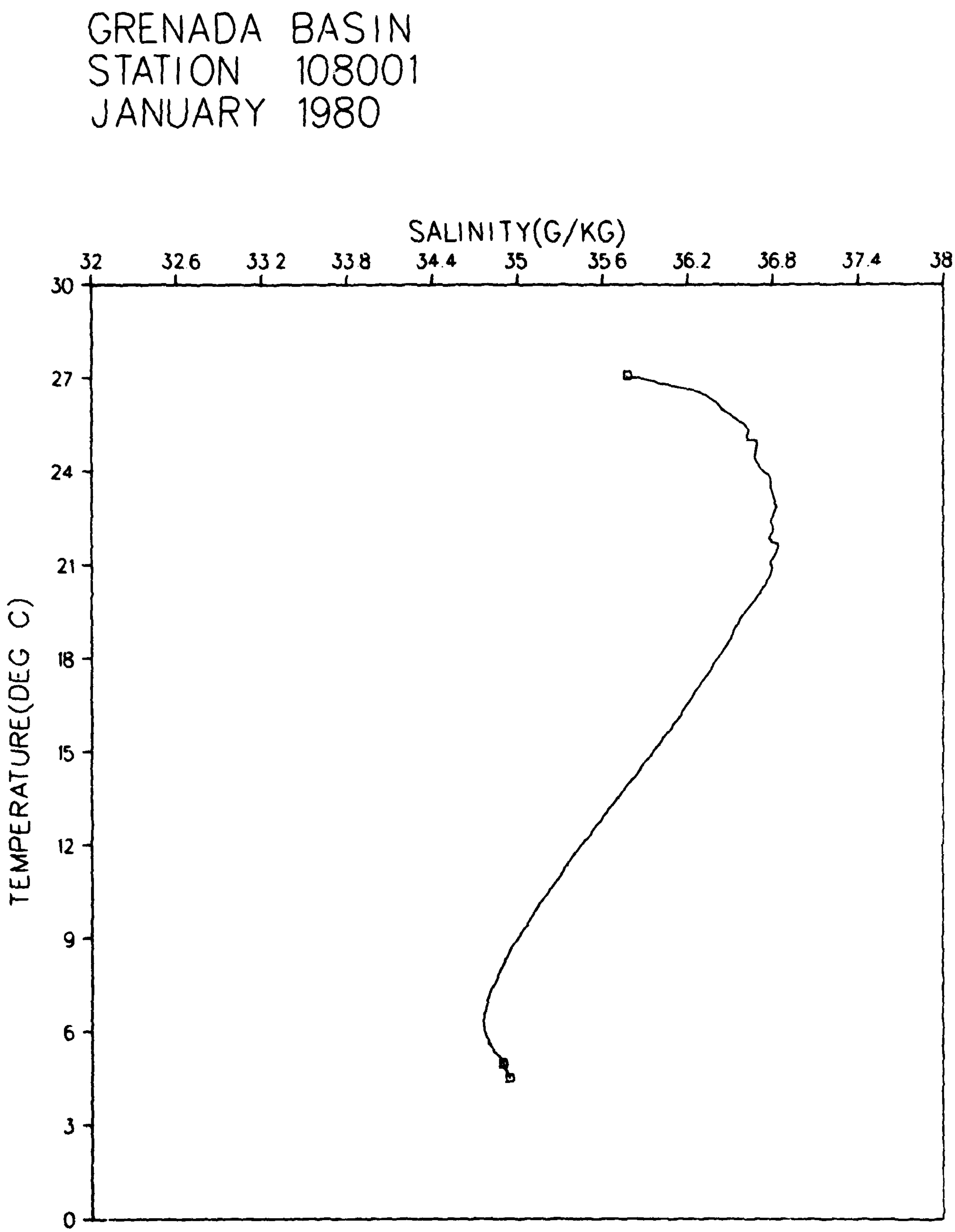

GRENADA BASIN
STATION 108001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 224.

GRENADA BASIN
STATION 109001
JANUARY 1980

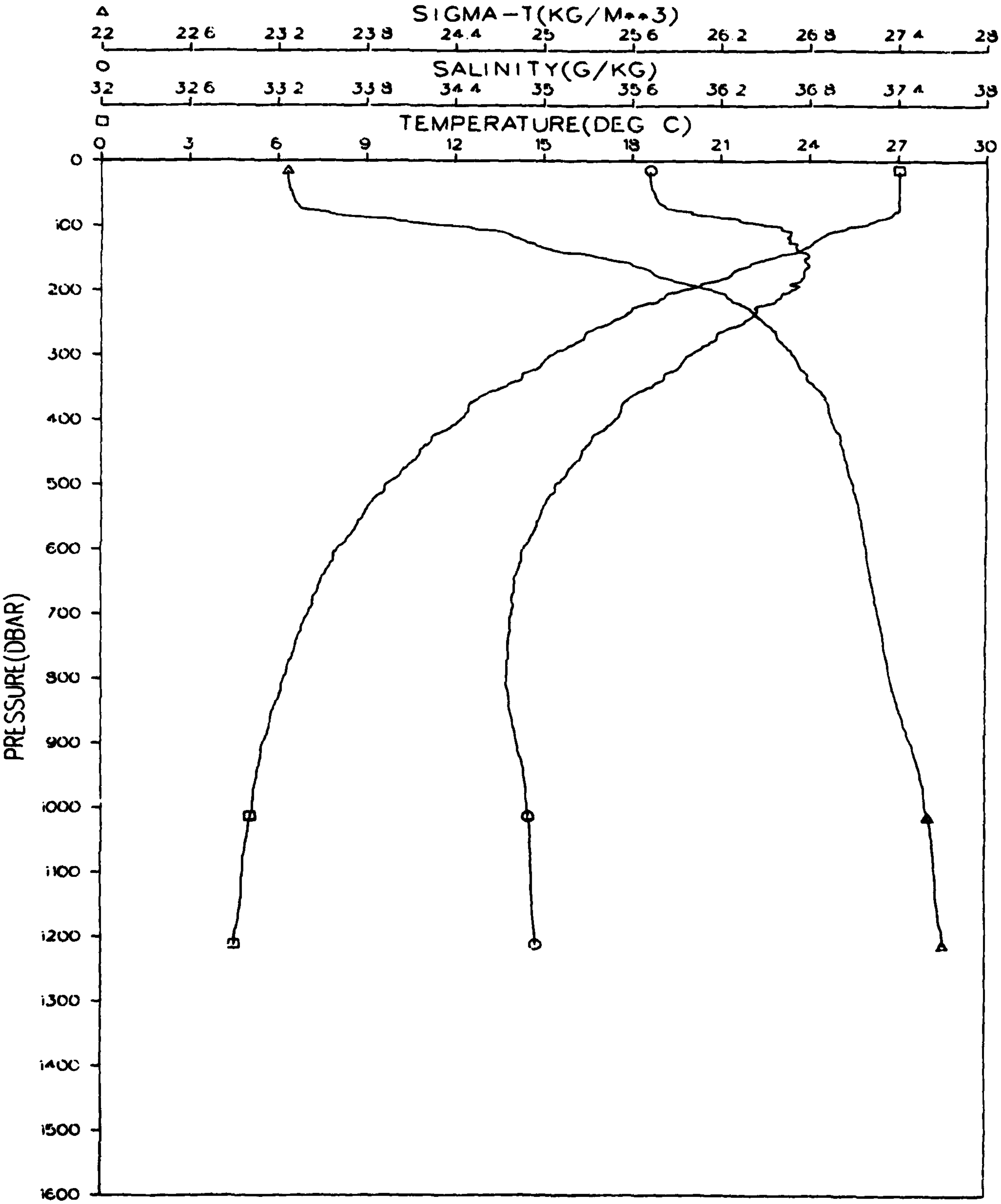


Figure 225.

GRENADA BASIN
STATION 109001
JANUARY 1980

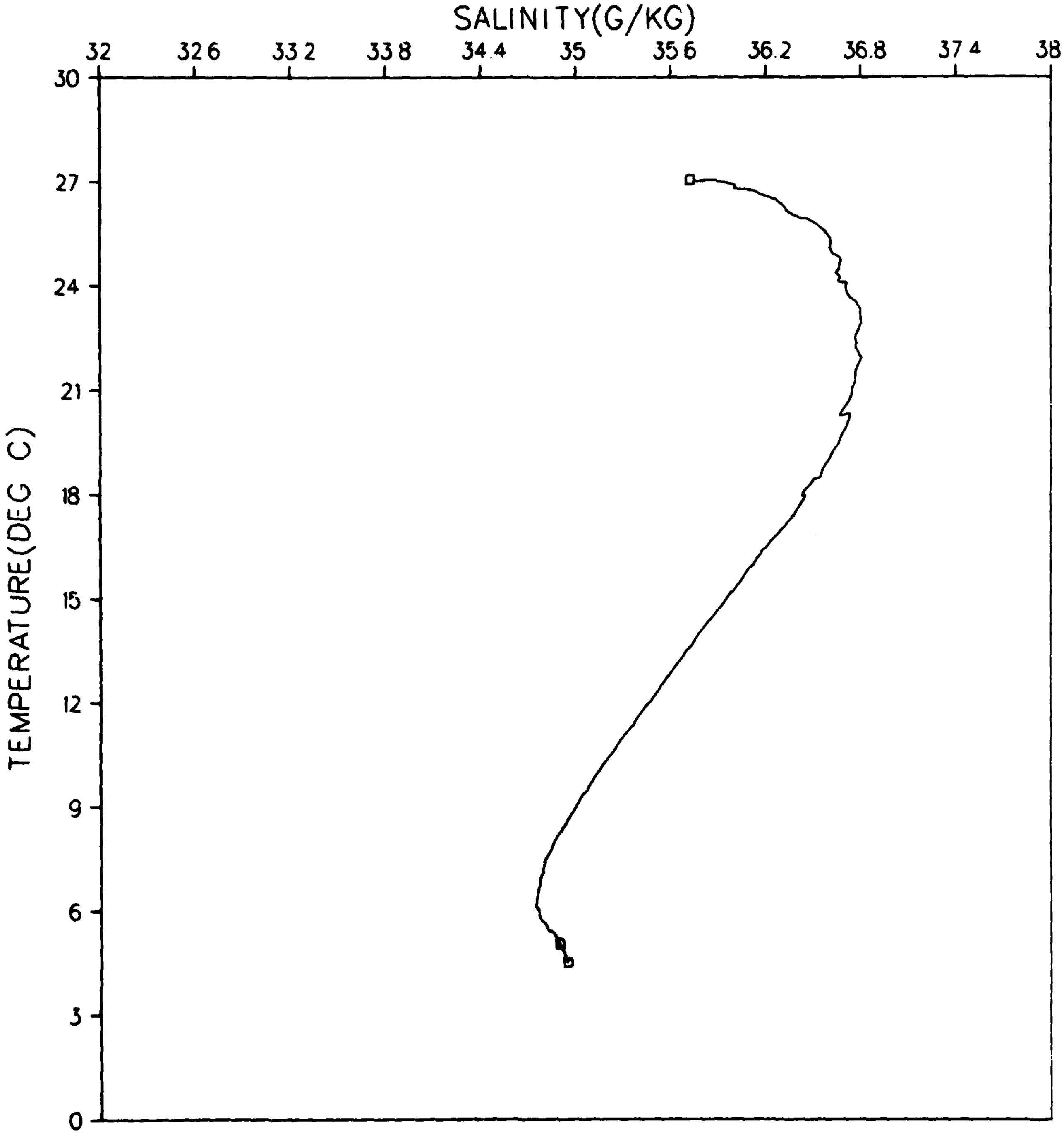


Figure 226.

GRENADA BASIN
STATION 110001
JANUARY 1980

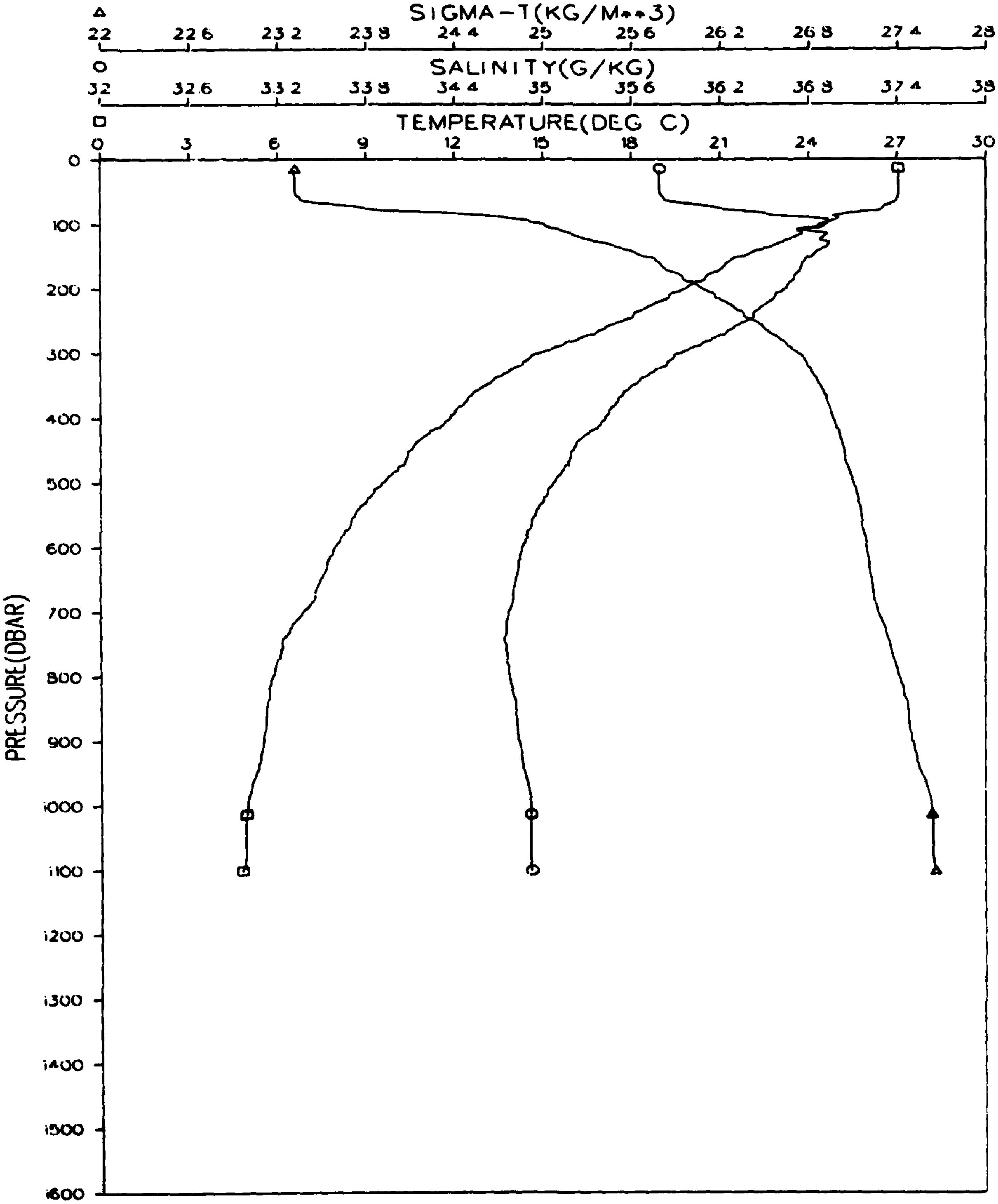


Figure 227.

GRENADA BASIN
STATION 110001
JANUARY 1980

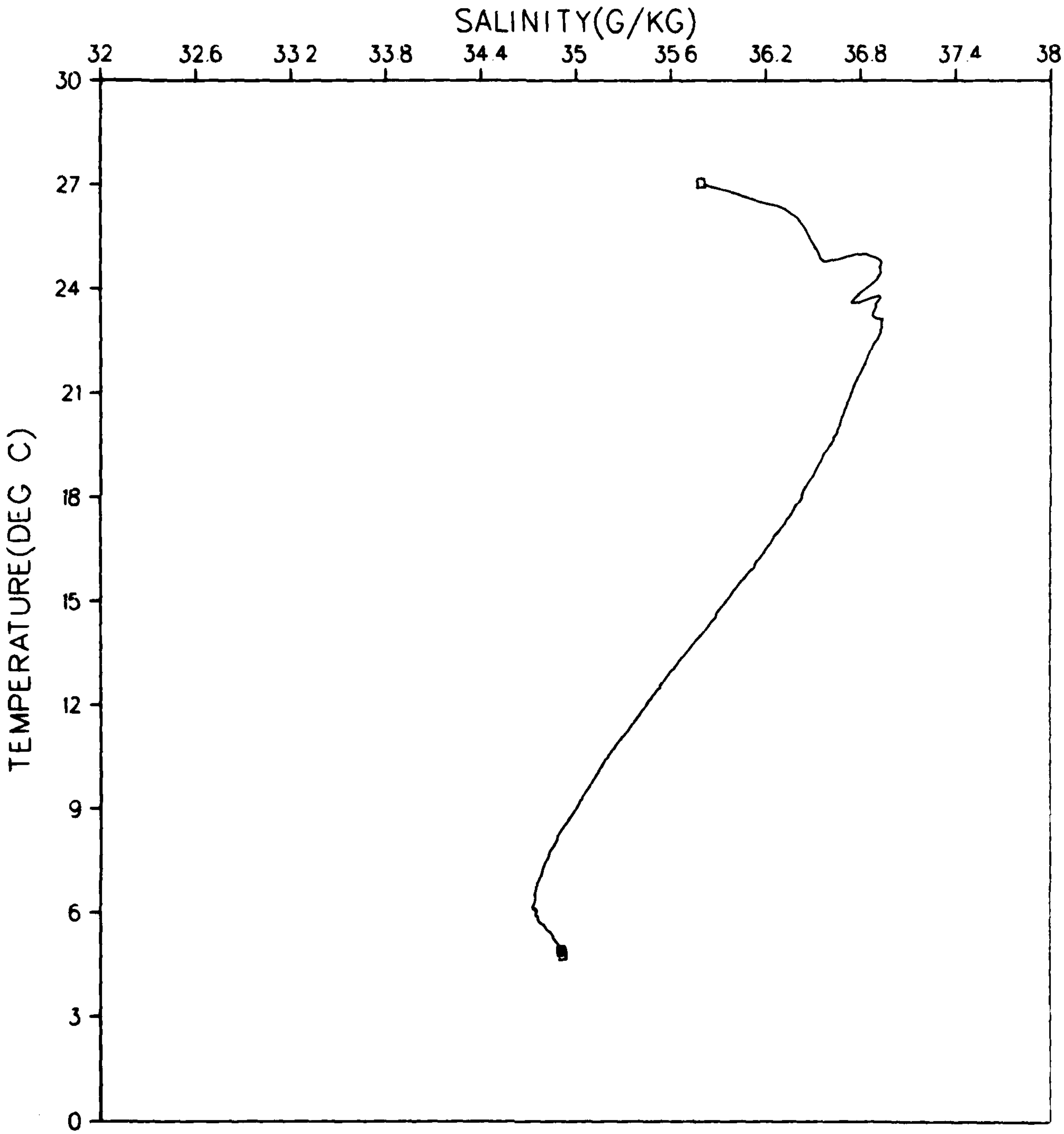


Figure 228.

GRENADA BASIN
STATION 111001
JANUARY 1980

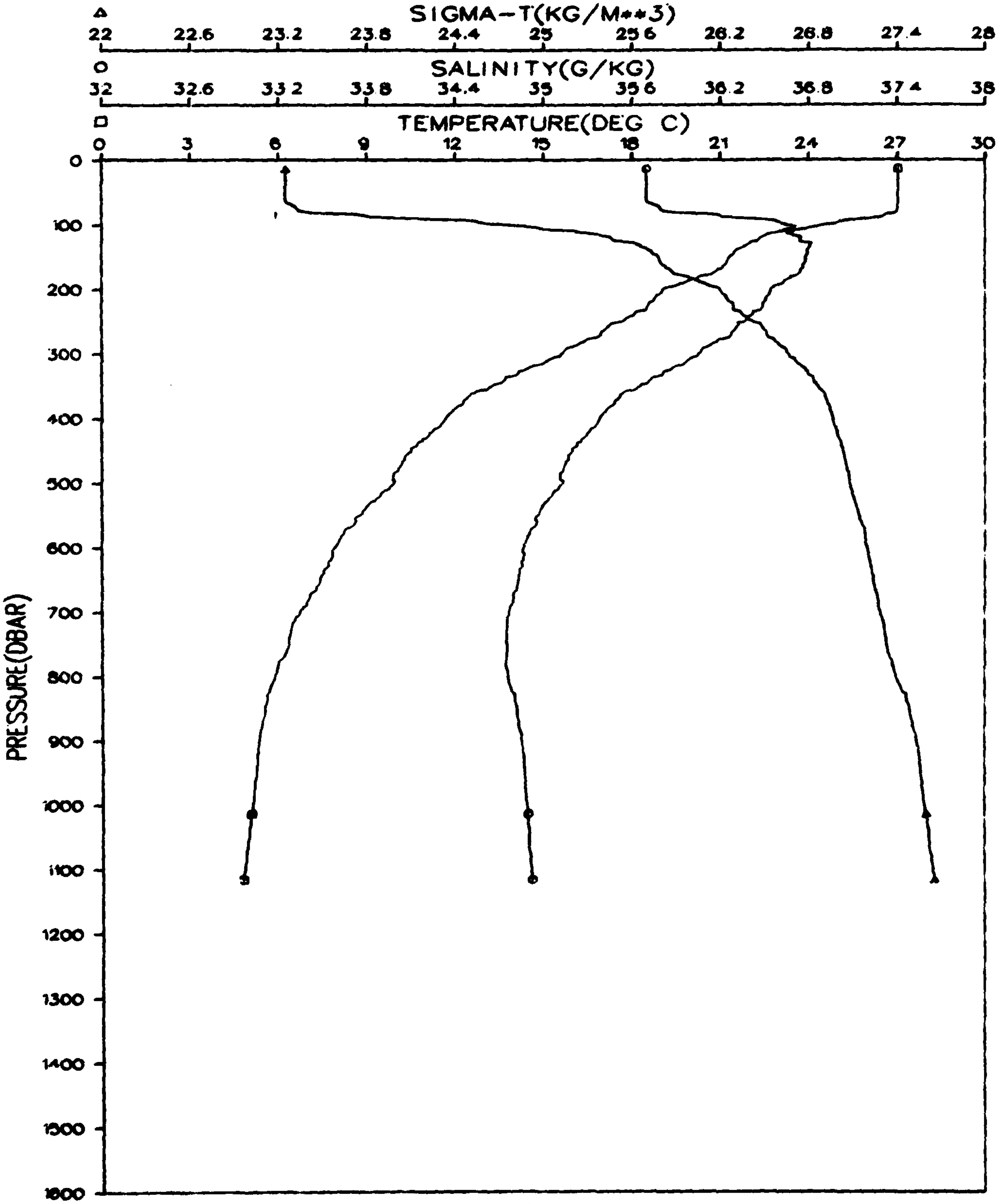


Figure 229.

GRENADA BASIN
STATION 111001
JANUARY 1980

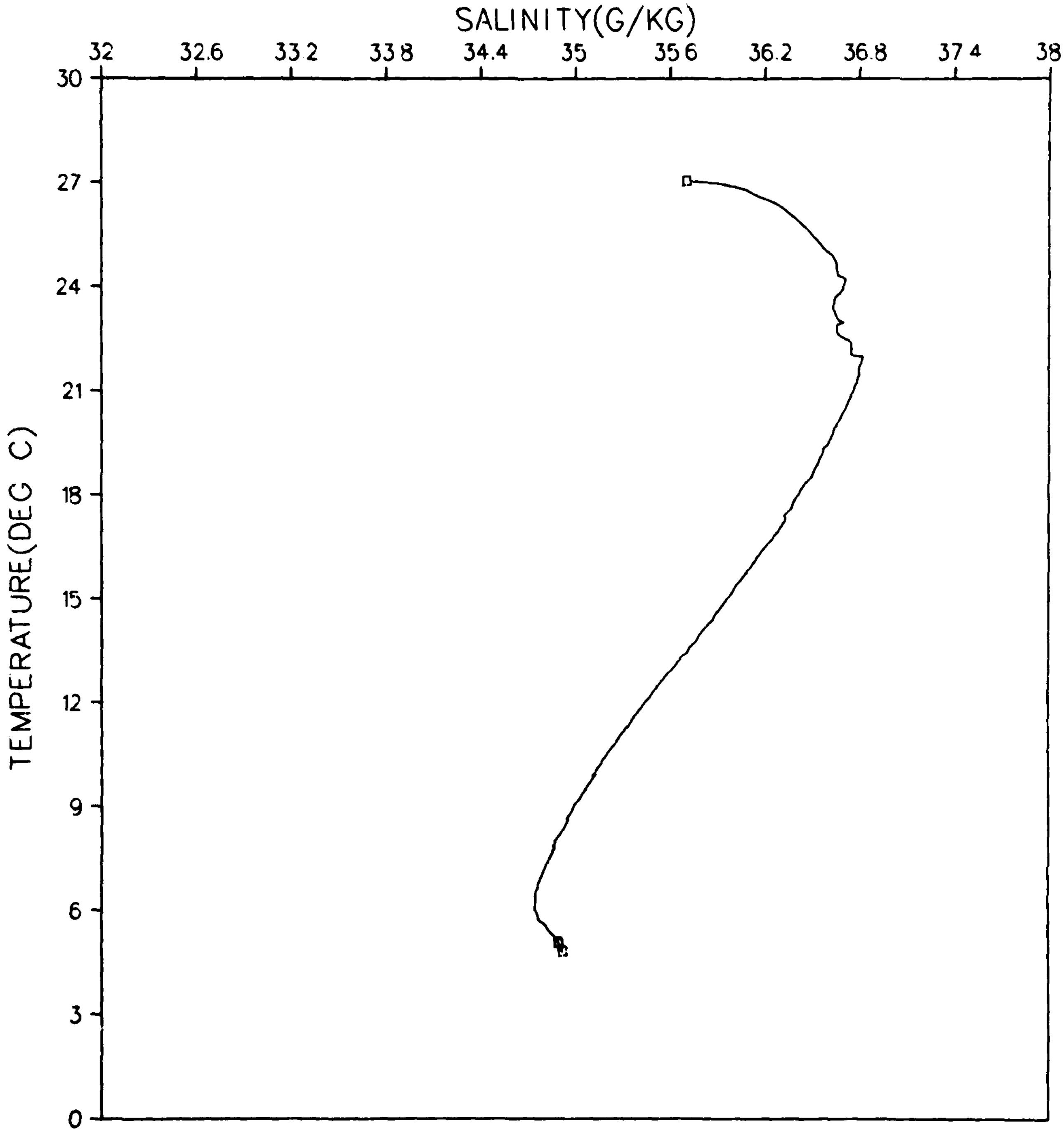


Figure 23C.

GRENADA BASIN
STATION 112001
JANUARY 1980

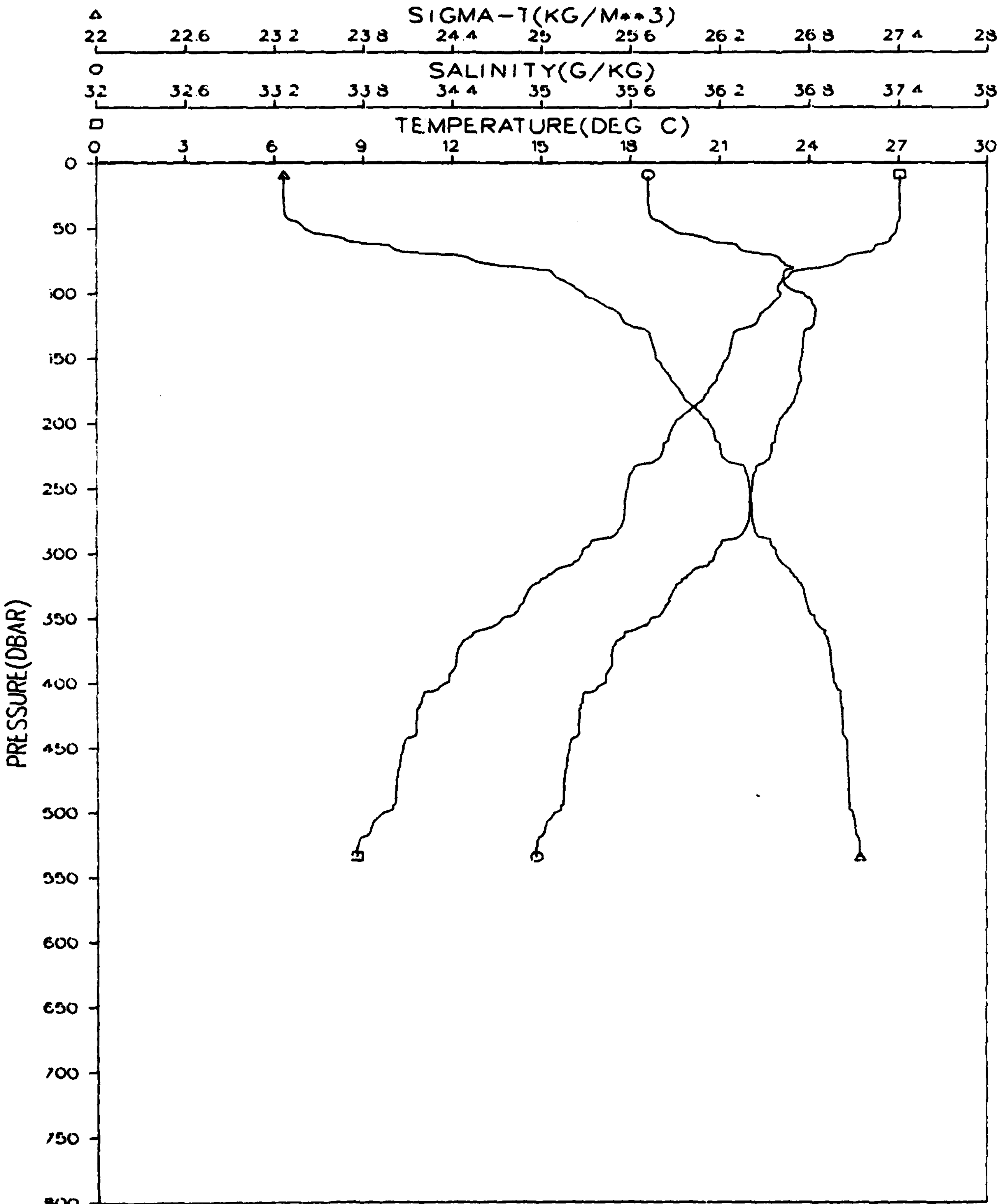


Figure 231.

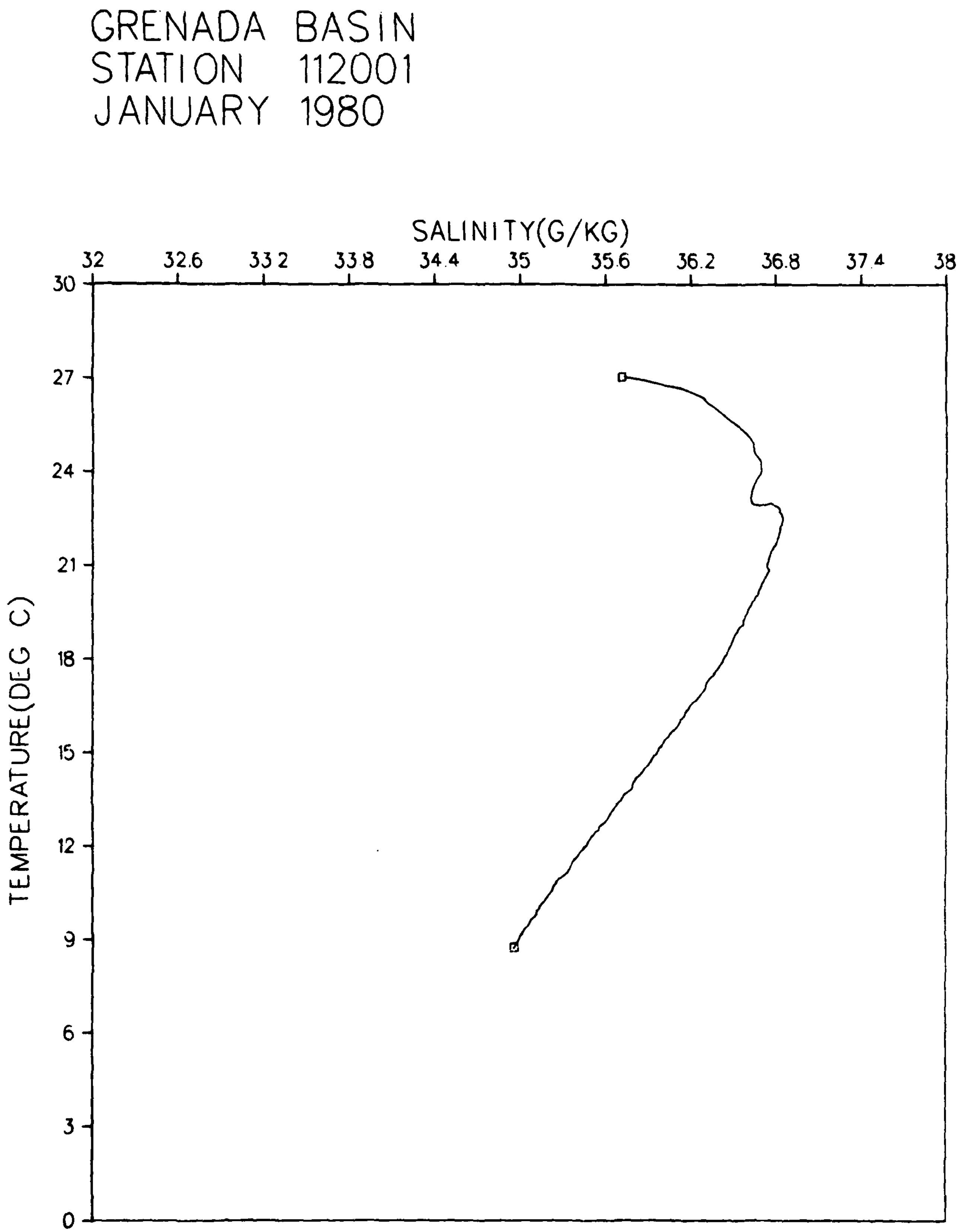

GRENADA BASIN
STATION 112001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 232.

GRENADA BASIN
STATION 113001
JANUARY 1980

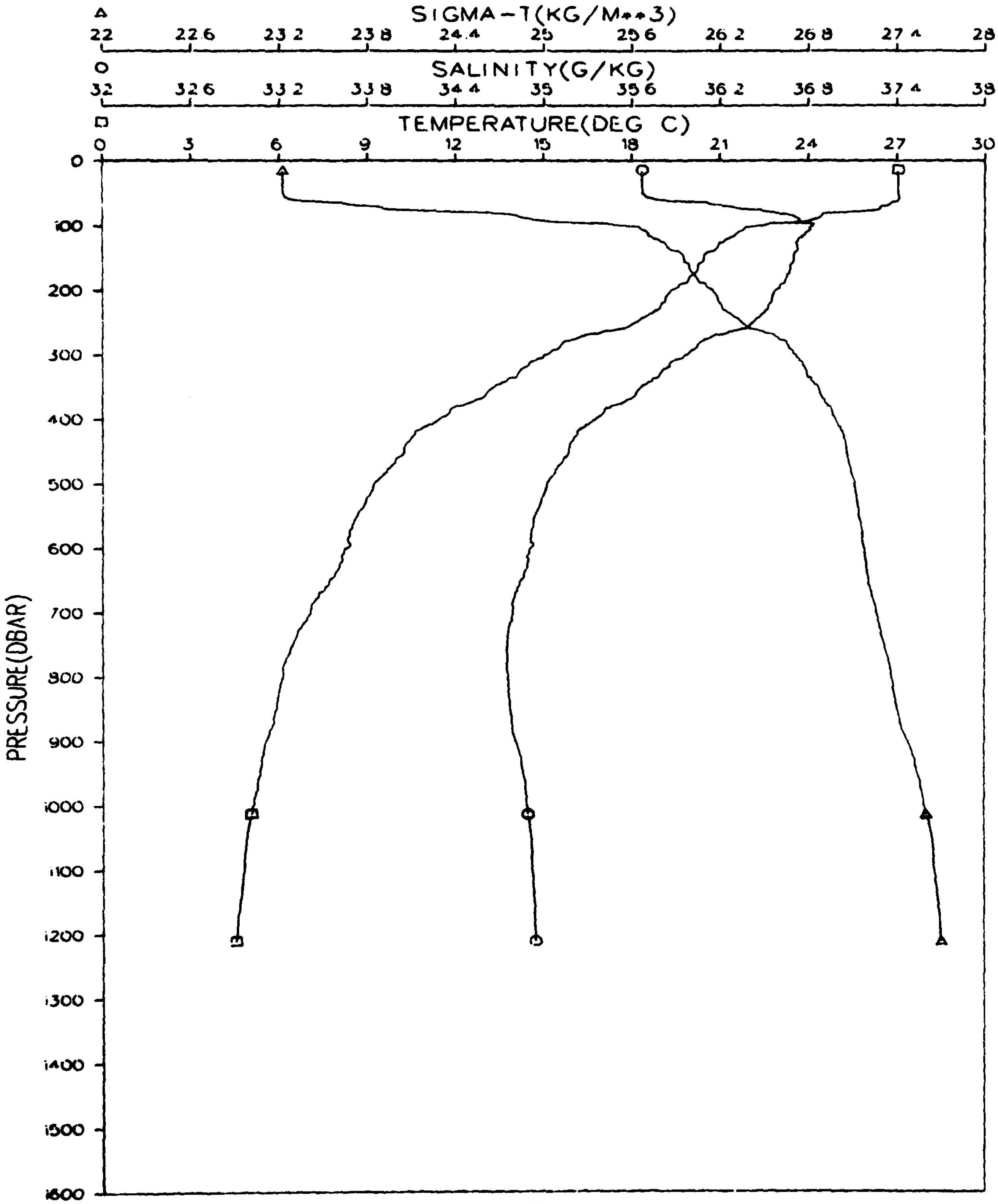


Figure 233.

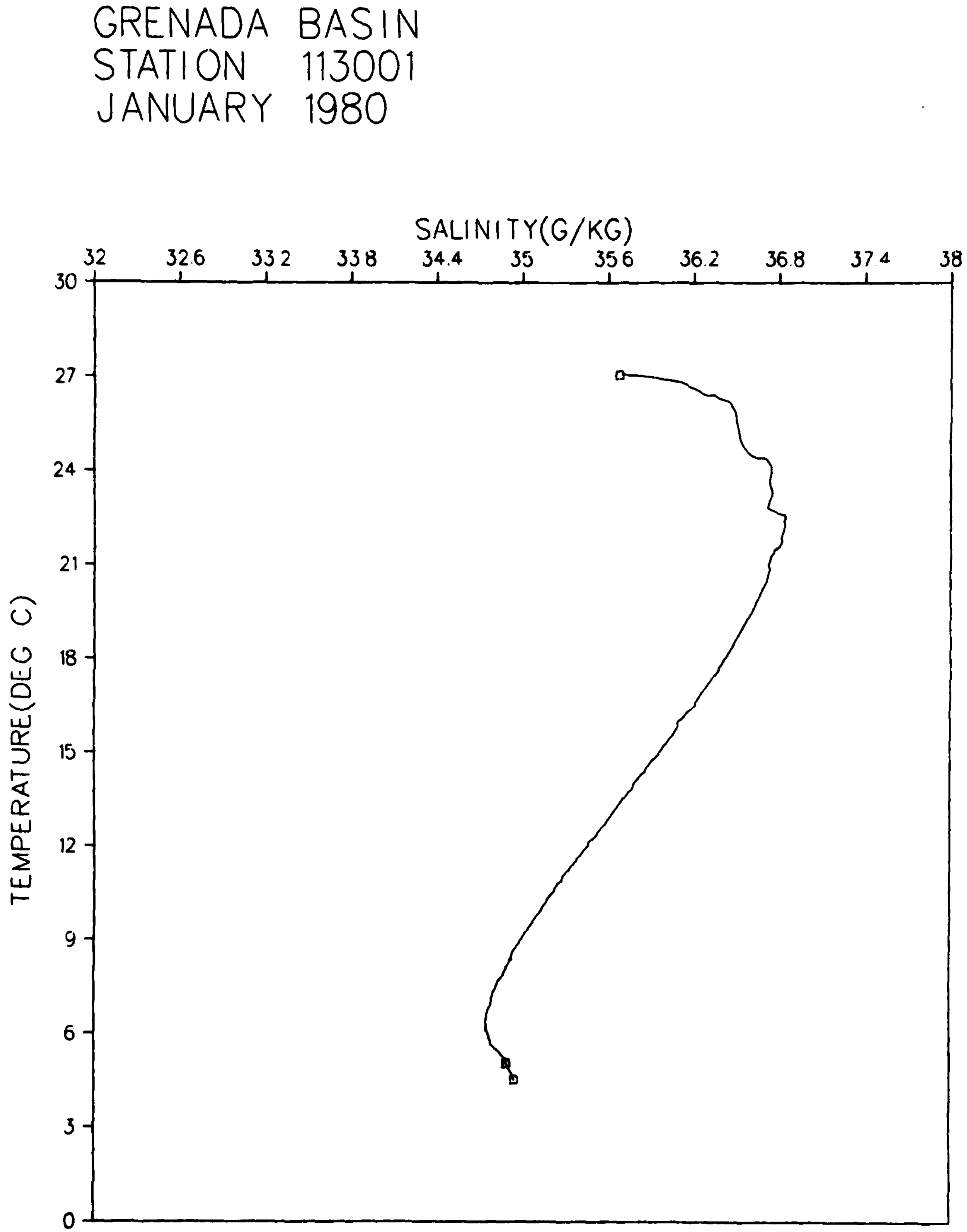

GRENADA BASIN
STATION 113001
JANUARY 1980
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
30
27
24
21
18
15
12
9
6
3
0

Figure 234.

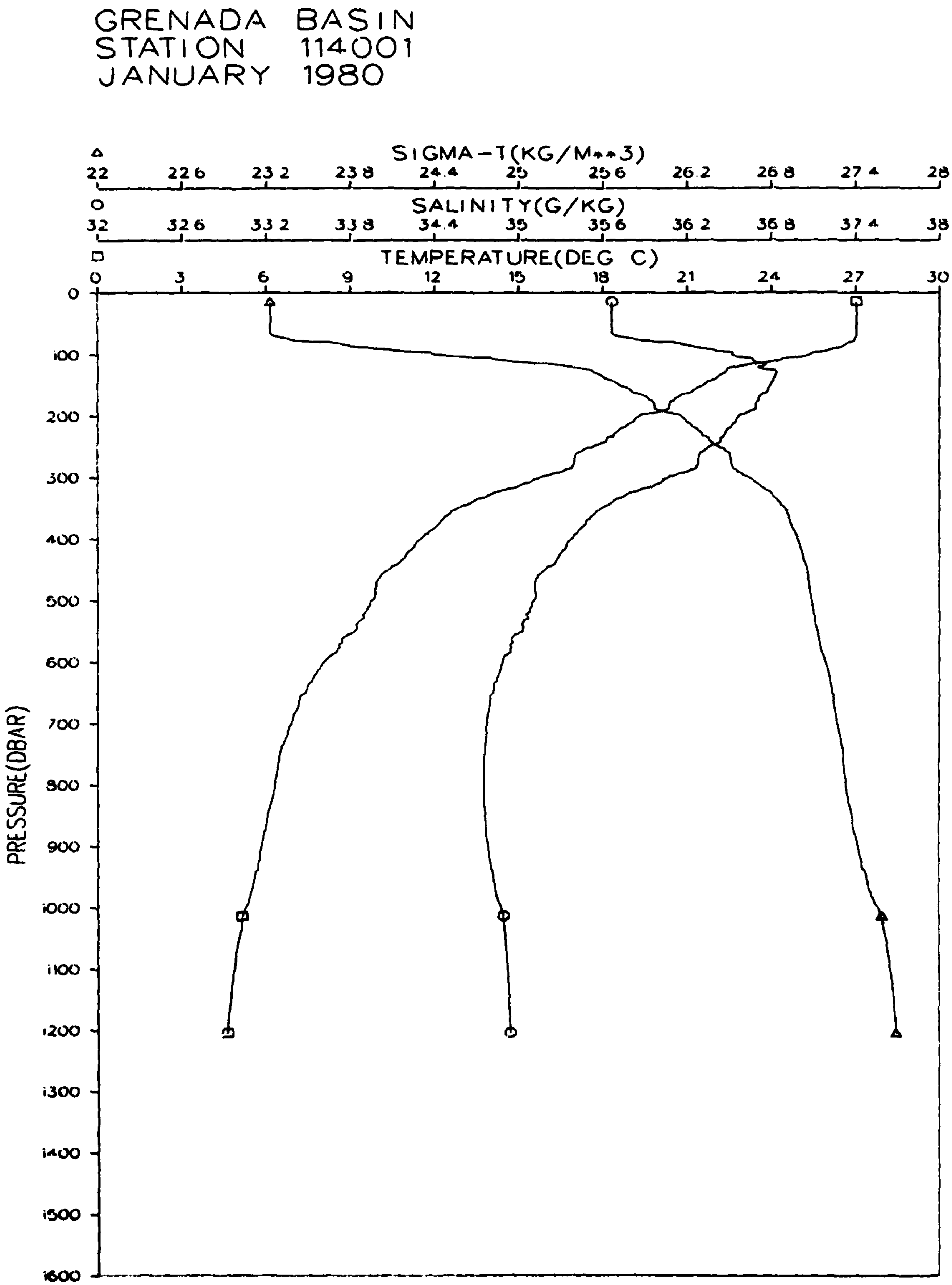

GRENADA BASIN
STATION 114001
JANUARY 1980
SIGMA-T(KG/M**3)
22
22.6
23.2
23.8
24.4
25
25.6
26.2
26.8
27.4
28
SALINITY(G/KG)
32
32.6
33.2
33.8
34.4
35
35.6
36.2
36.8
37.4
38
TEMPERATURE(DEG C)
0
3
6
9
12
15
18
21
24
27
30
PRESSURE(DBAR)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

Figure 235.

GRENADA BASIN
STATION 114001
JANUARY 1980

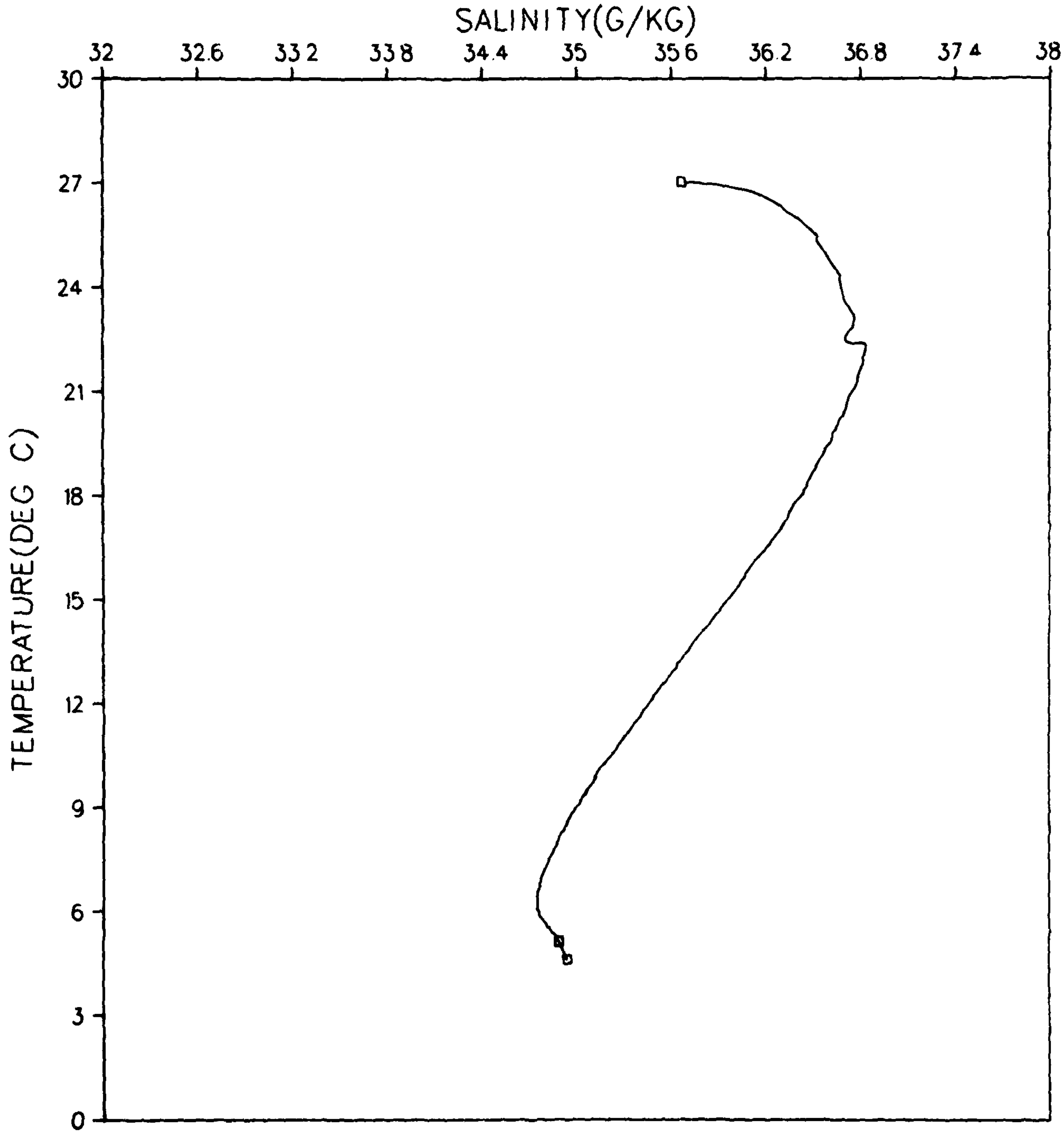


Figure 236.

GRENADA BASIN
STATION 115001
JANUARY 1980

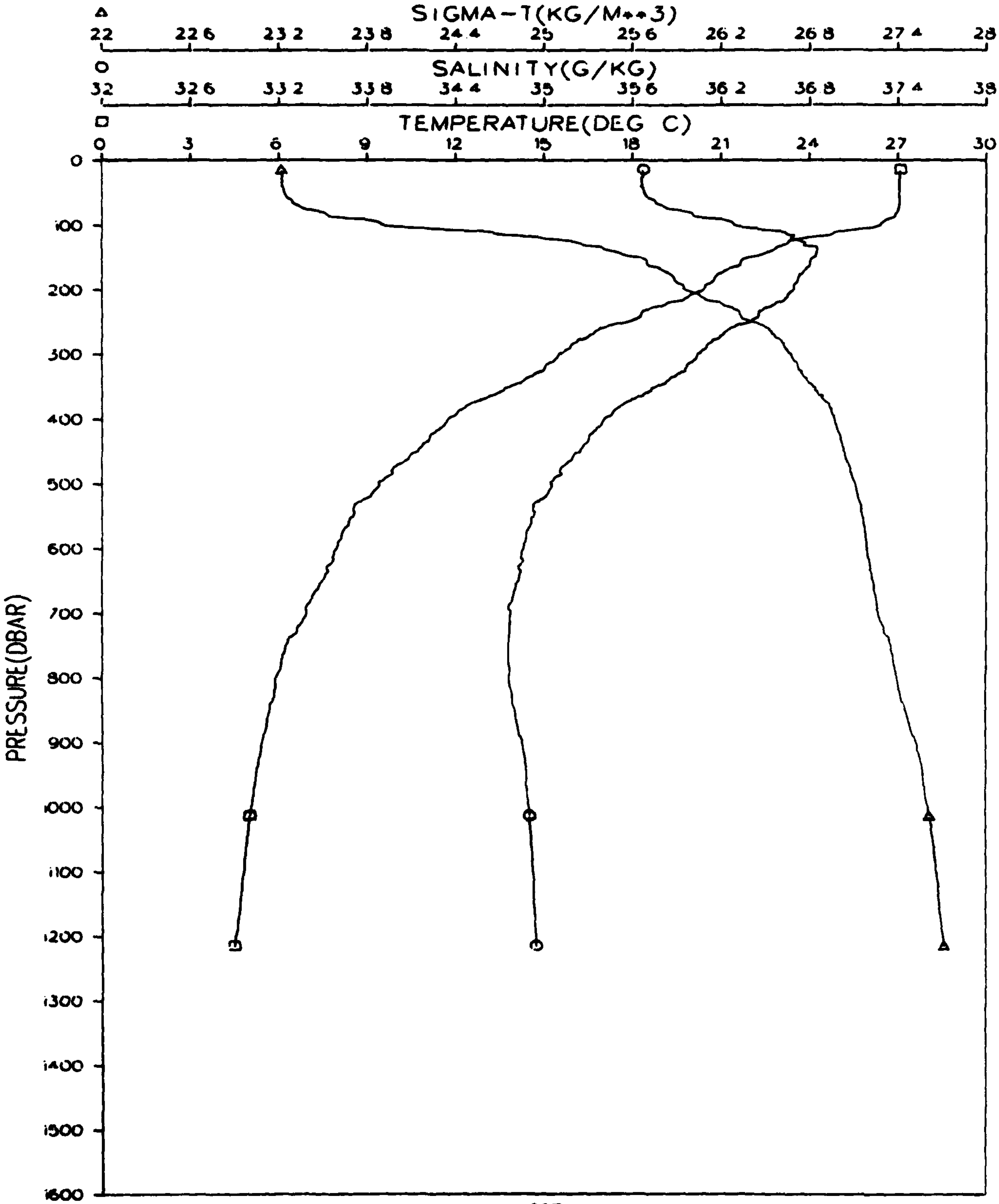


Figure 237.

GRENADA BASIN
STATION 115001
JANUARY 1980

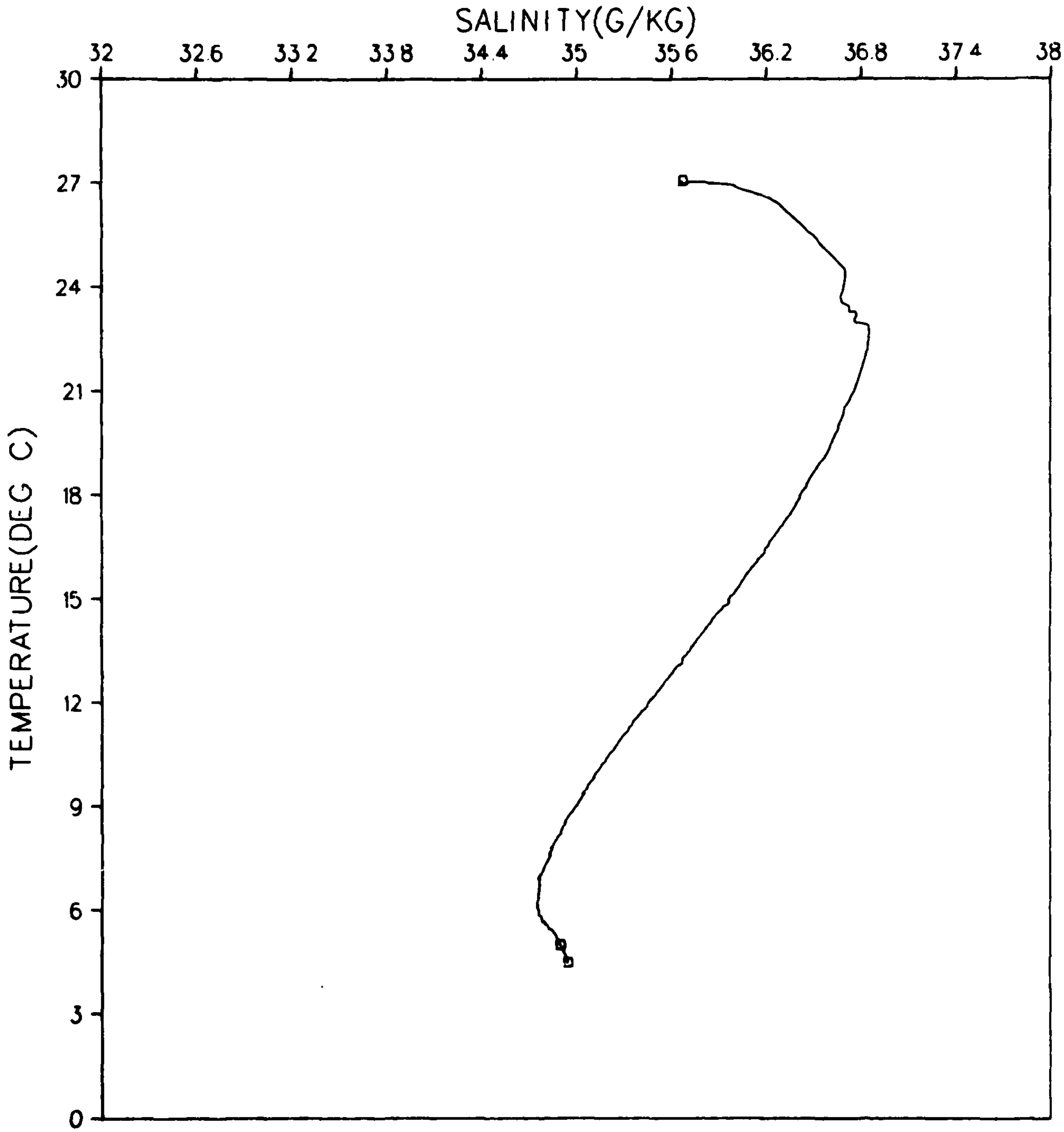


Figure 238.

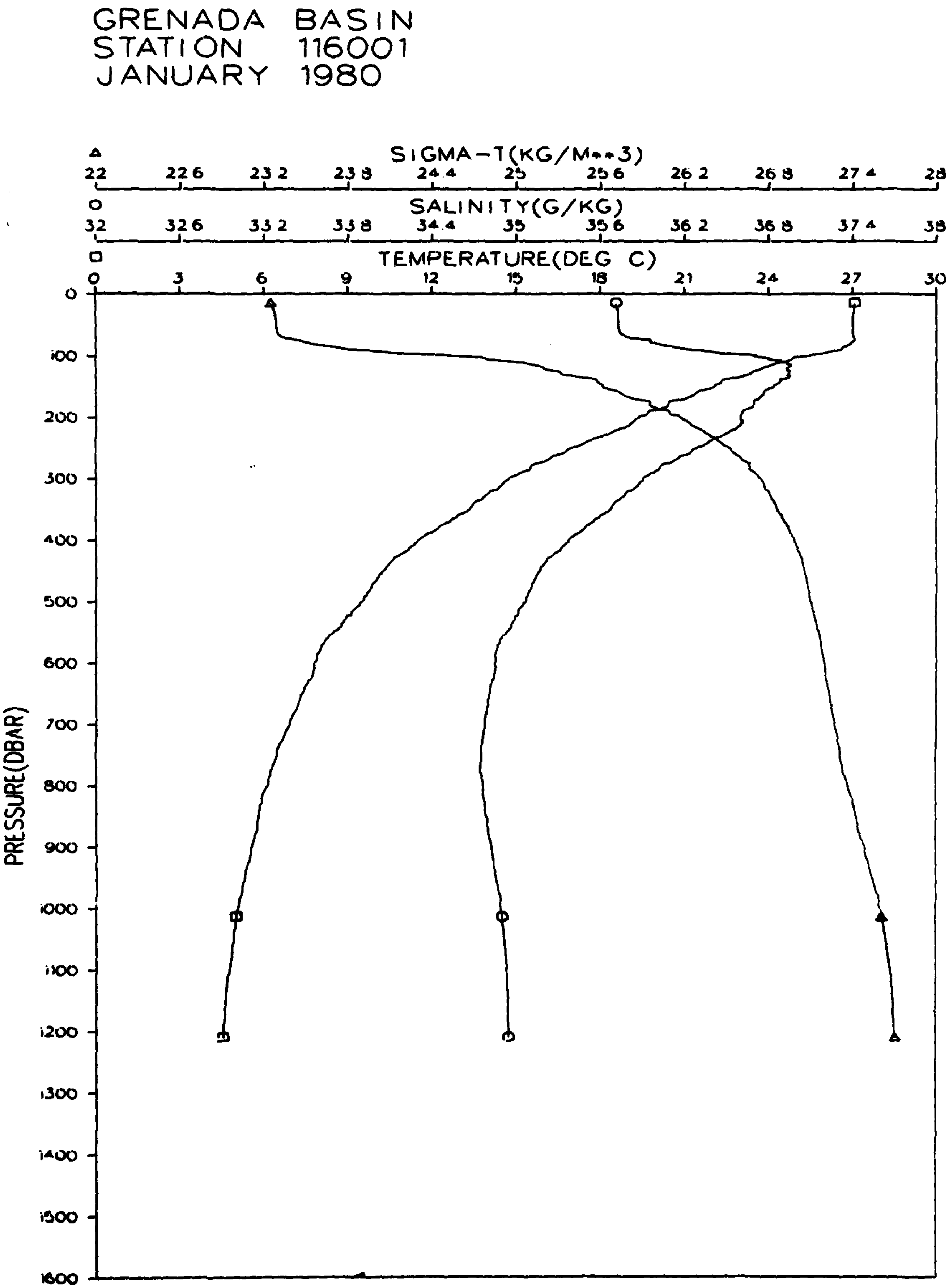

GRENADA BASIN
STATION 116001
JANUARY 1980
SIGMA-T(KG/M**3)
22 22.6 23.2 23.8 24.4 25 25.6 26.2 26.8 27.4 28
SALINITY(G/KG)
32 32.6 33.2 33.8 34.4 35 35.6 36.2 36.8 37.4 38
TEMPERATURE(DEG C)
0 3 6 9 12 15 18 21 24 27 30
PRESSURE(DBAR)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600

Figure 239.

GRENADA BASIN
STATION 116001
JANUARY 1980

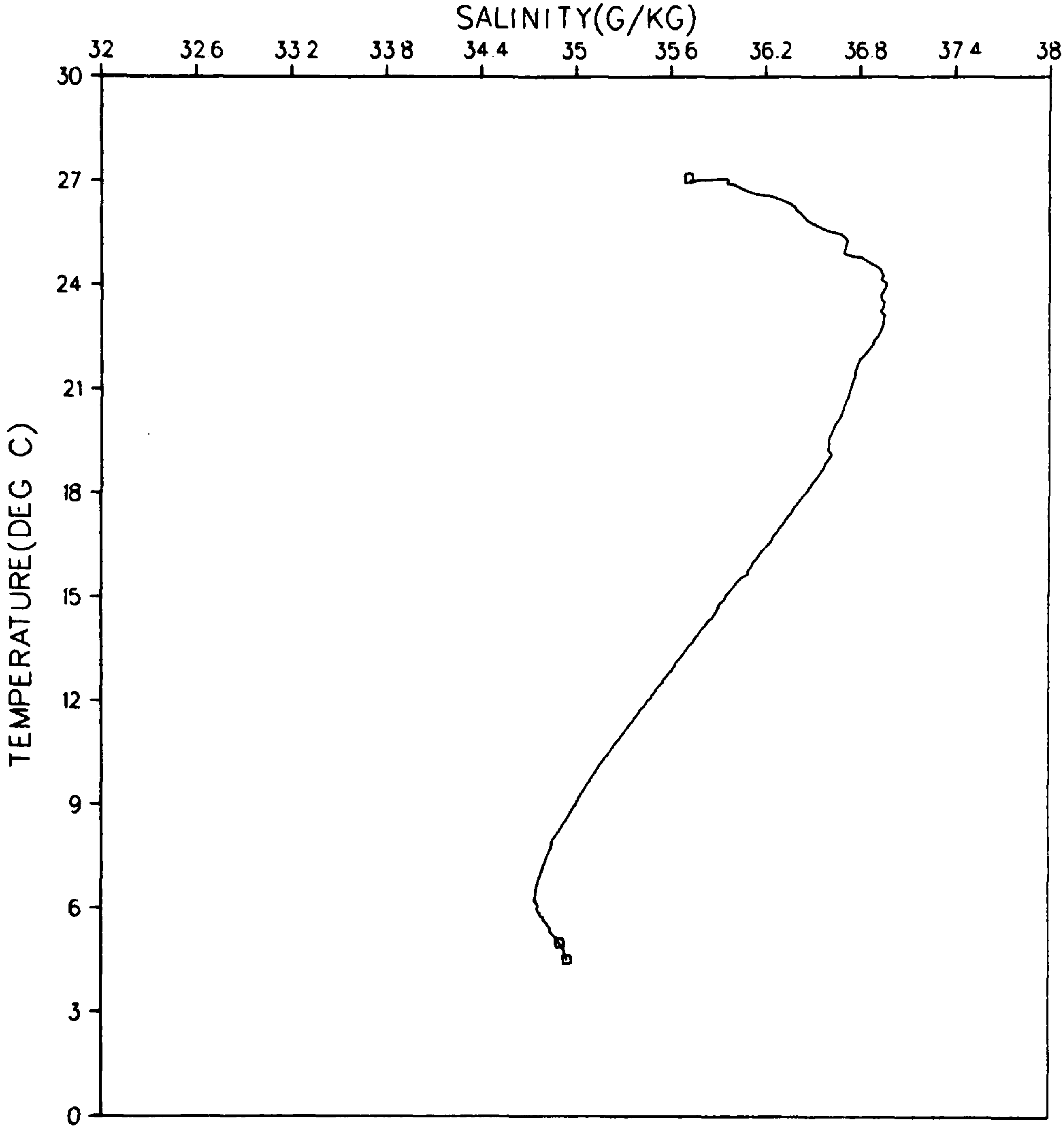


Figure 240.

GRENADA BASIN
STATION 117001
JANUARY 1980

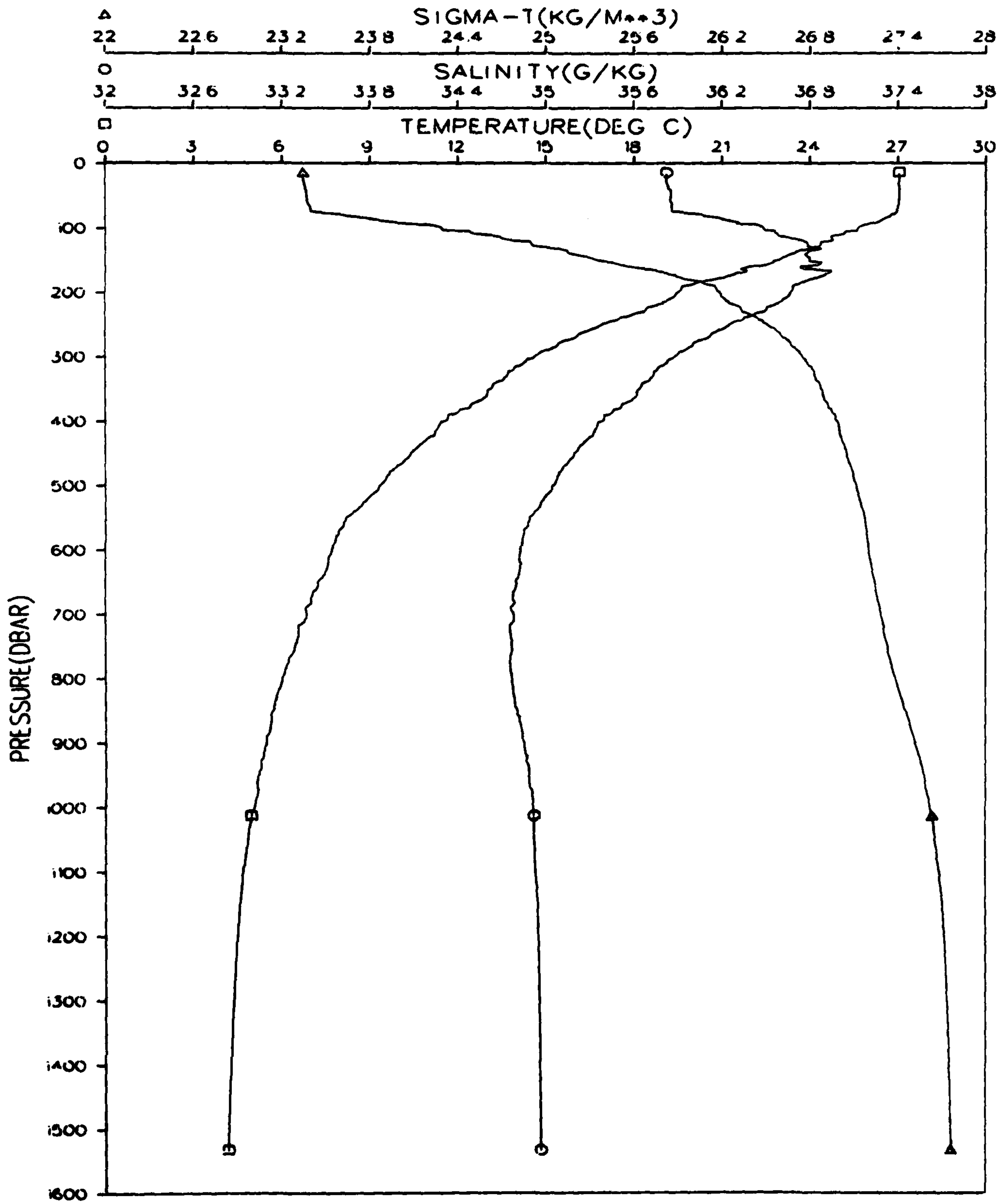


Figure 241.

GRENADA BASIN
STATION 117001
JANUARY 1980

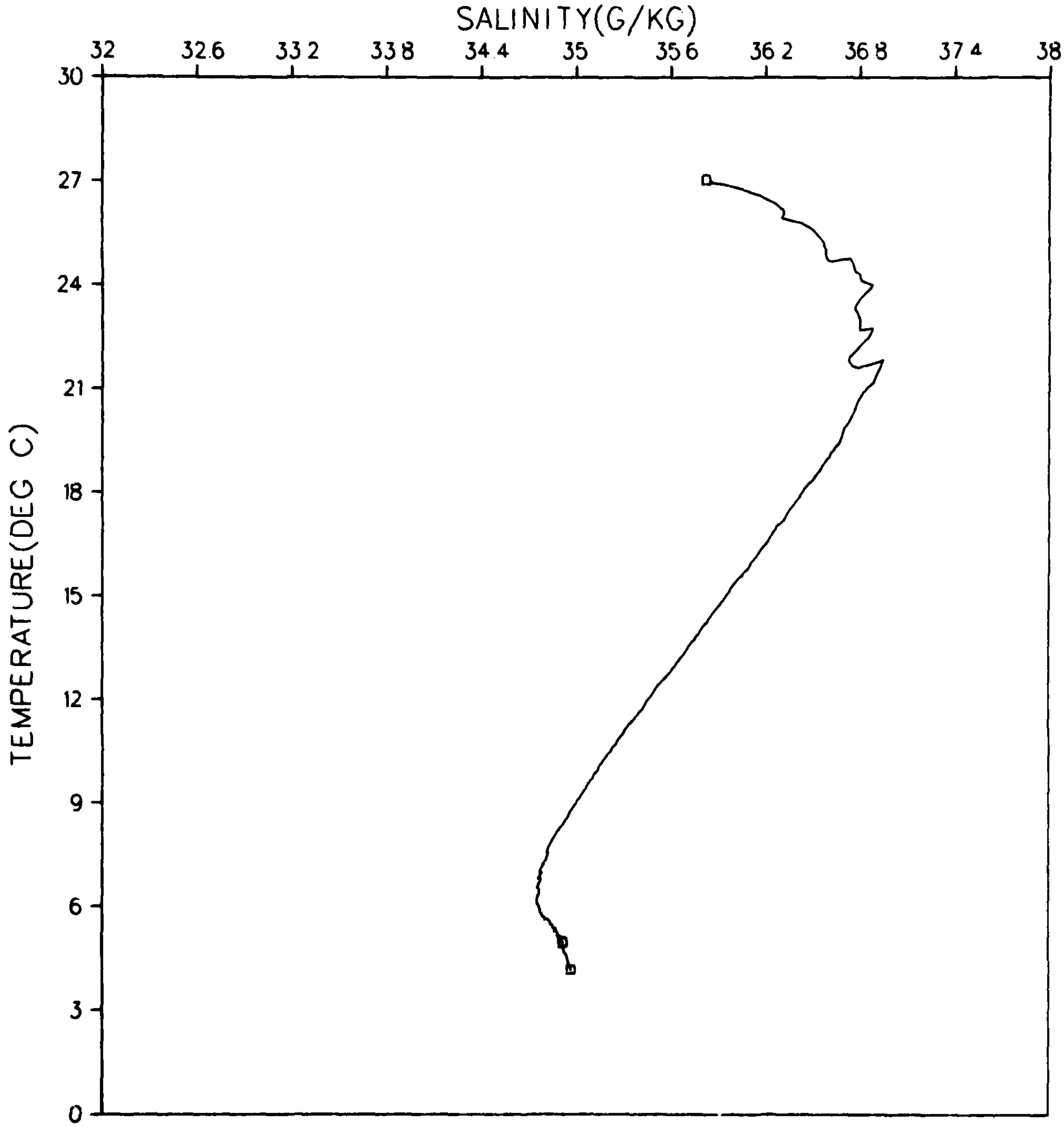


Figure 242.

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Eddies	Inflow	Hydrographic Data
Mesoscale	Expendable Bathythermographs	
Antilles	Aircraft Expendable Bathythermographs	
Caribbean	Conductivity-Temperature-Depth	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

As part of a study on mesoscale variability in the southeastern Caribbean Sea, we occupied 117 conductivity-temperature-depth (CTD) stations and made 235 expendable bathythermograph (XBT) drops during 12-27 Jan 1980. We present the cruise track of the ship and also the tracks of three aircraft XBT (AXBT) flights made concurrently. We discuss data editing and quality control procedures that were used for CTD (but not for XBT and AXBT) data and present vertical profiles and TS diagrams for each station. In addition to the four water

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types that have long been known to be present (surface water, subtropical water, Antarctic intermediate water, and North Atlantic deep water), the profiles show many features at vertical scales of order 10 meters.

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